COAL AGE

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The history of humanity is largely a history of its leaders. In connection with absolute monarchies such a remark is not surprising, but the statement holds with equal force in a consideration of any type of democracy.

Professors of political economy may tell us that such a belief is not in accord with the spirit of democracy, but they cannot disprove the truth of the assertion.

Not only is this statement true with reference to politics, but it holds with equal force in trades and professions. Let us hasten to add that we are not launching on a discussion in political economy.

We only wish to point out that miners are not the only class of human beings who follow after leaders. Even the most casual reading of history will also convince any one that leaders in the past have been of every sort, good, bad and indifferent. Why wonder then that miner folk are often led in search of false gods.

Let's go a little farther; since the leaders themselves are only human beings, is it strange that even they are sometimes misled by visions, or if not misled, are frustrated by other leaders who are following visions?

Such facts emphasize the folly of ignoring leaders. If they have had dust thrown in their eyes, help them to remove it. If they are attempting to throw dust in other people's eyes, make *them* (the leaders) realize that it can't be done. The most formidable ones are often victims of nightmare.

Most steps forward in industrial relations can be traced back to leaders who have progressed beyond their fellows and then have reached out to pull the lagging ones ahead.

Compare this method of progress with the only other system possible, namely, educating an entire community so that an educated leader must be chosen and the possibilities are apparent at once.

And even granting that the whole scheme is undemocratic (which it most certainly is), what harm can come of accepting the inevitable and trying to make the best of it?

If you think your are above hero worship yourself just think back a few years and try to explain some of your actions during one or two political campaigns. Better look at yourself in a mirror while you are doing it.

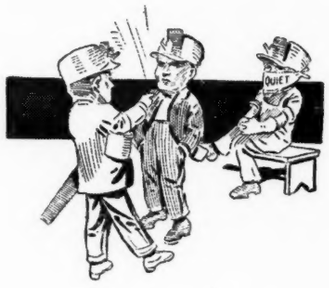
The Coal Miner

(After Kipling's, "The Sapper")

By Berton Braley

Written expressly for Coal Age

He may be a Russian, a Czech or a Pole,
He's princip'ly human, but partially mole,
And down in the workings he digs up the coal
And works for the wage of a miner.



He's seldom an angel—and sometimes a scamp,
He's often a bit of a rover and tramp,
But down in the darkness, the dust and the damp
He follows the trade of a miner.

Now if you would join with this coal-mining clan,
You hark to your elders as close as you can,
And listen to me while I tell you the plan
To pattern your life as a miner.

Be modest and quietlike when you begin,
Don't try to hand out any manner of chin,
It's a wise guy who doesn't get fresh and butt in,
When he's a new hand as a miner.

Don't think when you're careless that's showing your skill,
Don't take any risks that are not on the bill,
Don't smoke where it's gassy or tamp with a drill,
It proves you a fool of a miner!

When working with powder be gentle, that's all,
Don't slam it around like a cheap rubber ball,
For it sometimes makes pieces exceedingly small
Of someone who once was a miner!

Keep out of the places that sell you the drink,
They'll give you—a souse, and they'll take all your chink,
And they're likely to land you kerplunk in the clink
Which is not a bit nice for a miner.

Just take your pay home to your children and wife
Don't get into rows and dissensions and strife,
And you'll probably rise to a station in life,
As foreman of hundreds of miners!

It's true I ain't done things exactly that way,
And that's why I'm toiling and sweating today,
Don't do as I DO—but just do as I SAY,
Which is first class advice for a miner!

Modern Preparation of Bituminous Coal at the Mine

By R. G. Read*

SYNOPSIS—Broadly speaking, there are two classes of preparation plants—those handling steam coal and those treating domestic fuel. Representative examples of each type are here described.

The last 10 years have witnessed a marked improvement in the preparation of coal at the mines. This condition has been brought about by three main causes:

1. Increased use of mechanical stoking and combustion appliances, which has necessitated more careful sizing to suit individual requirements.

2. Scientific purchasing with respect to the sulphur and ash content of the coal which has forced a thorough cleaning.

3. Increased cost of labor at the mines, which has made advantageous the use of machinery wherever possible.

Coal preparation may be roughly divided into two classes corresponding to the existing market requirements:

1. Preparation for steam purposes, under which may be included the coal for the lake trade, which is only partially prepared at the mine.

2. Preparation for domestic or special uses.

In the general consideration of the subject, it may be well to call particular attention to the advisability of making a careful investigation into the physical characteristics of the particular coal in question before deciding to what extent preparation should be attempted. The coal from the different fields of the country, and, in fact, from different parts of the same region, varies to such an extent that no hard-and-fast rules may be laid down.

The prudent owner will, however, before embarking on the construction of an elaborate and expensive plant for the preparation of his coal, determine whether or not its physical nature is such that it will stand the treatment which may be necessary. The coal may be so soft or friable and the breakage and resultant percentage of fine material be so great as to make the preparation of no commercial value. The writer has seen a number of cases of this kind where large sums have been expended, resulting only in disappointment. There are some coals which are affected by the atmosphere to such an extent that careful screening and sizing at the mine is not apparent when the fuel reaches its destination. These remarks are intended to refer only to the sizing and not to the cleaning processes, as cleaning any kind of coal increases its commercial value.

In order that this article may be of greater interest it has been deemed advisable to describe two representative plants covering the general divisions referred to above. It is not to be understood that these examples cover all points involved, but they have been chosen as being typical and because no washery is operated in connection with either one.

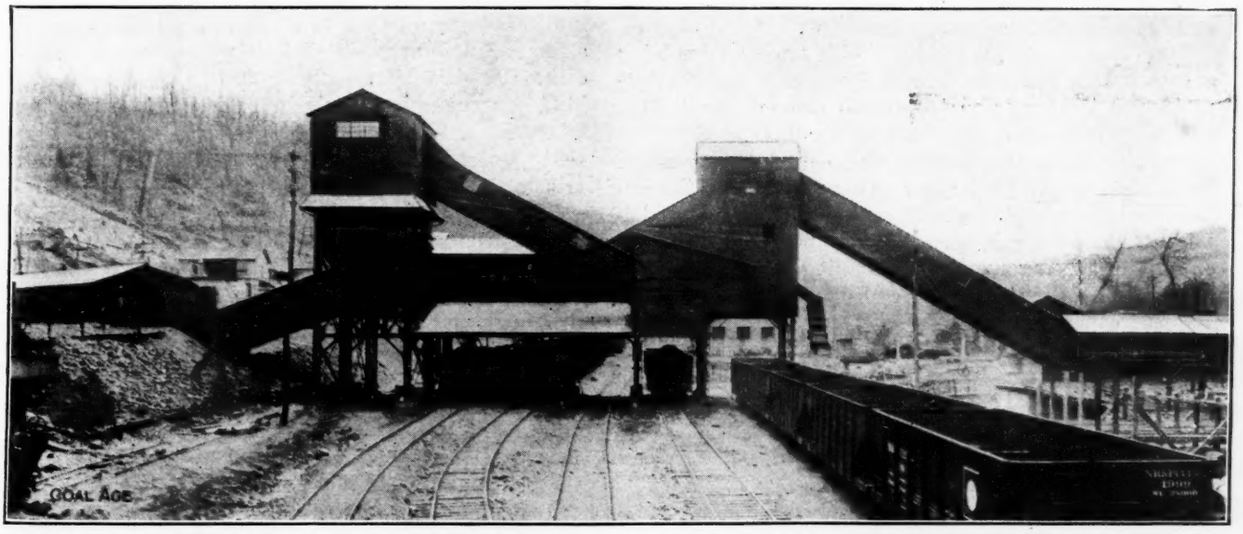


Fig. 1. A Typical Plant for the Preparation of Steam Coal

The subject of coal washing is so intricate and of such a technical nature as to be best taken care of in a future article. It is now generally conceded that washing as a means of cleaning coal should only be applied to the small sizes, and even here its advisability should be considered with extreme care before this method is adopted.

A description of the two representative plants follows:

The Steam Coal Plant

The main points to be considered in the design of an equipment of this nature are simplicity in the handling of the coal and economy in power and labor. The preparation consists largely of screening the fine coal out of the run-of-mine. The present practice is to use gravity or stationary screens for this purpose.

Fig. 1 shows a general view of a double tipple of the

*Webster Bldg., Chicago, Ill.

latest design for this purpose. This consists of two entirely separate handling equipments, the right-hand side being arranged for screening purposes and the left for loading straight run-of-mine coal. No picking or cleaning other than an inspection in the railroad cars and the removal of large pieces of slate or refuse is provided for in this installation.

The operation is as follows: The coal is dumped from the mine cars into a receiving hopper of about 10 tons capacity, from which it is delivered by means of a reciprocating plate feeder to the top run of an inclined apron conveyor which elevates and discharges it into a small chute, from which it flows by gravity to the screens. The large coal passes over the screen and is loaded into the railroad cars by means of a curved-end loading chute with an adjustable apron.

This apron may be provided with fingers resembling a fork, which tends to deposit the small lumps underneath and the larger on top, which gives the loaded car a better commercial appearance. It was formerly the custom to design loading chutes to discharge crosswise or at right angles to the car. This necessitated the employment of at least two men, who were known as "trimmers," whose duty it was to build the pile on the car, this process being known as "topping out."

This was, of course, costly and dangerous, as the large lumps frequenty came down with such velocity as to injure the men. In no other detail has there been such improvement as in the design of these loading chutes. This will be more clearly understood from the fact that one person with small effort now loads the coal in quantities and in better condition than it could formerly have been done by four men.

Reverting to the consideration of the plant in question, the small coal drops through the upper screen onto the lower, where it is divided into two sizes, the larger being loaded as nut or egg on the center track. The upper screen is provided with suitable mechanism for quickly changing the spacing of the bars so as to vary the minimum size of the lump or maximum size of the small coal. The usual spacings are ¾ in., 1¼ in., 1½ in. and 3 in. The 1¼-in. spacing is the one most commonly used. In some installations this screen is made in sections about 4 ft. long, with a vertical drop of 4 in. to turn the coal over.

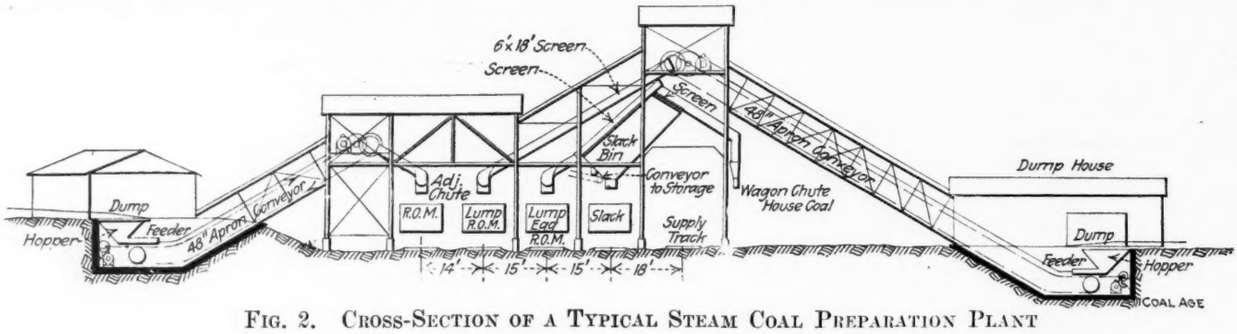


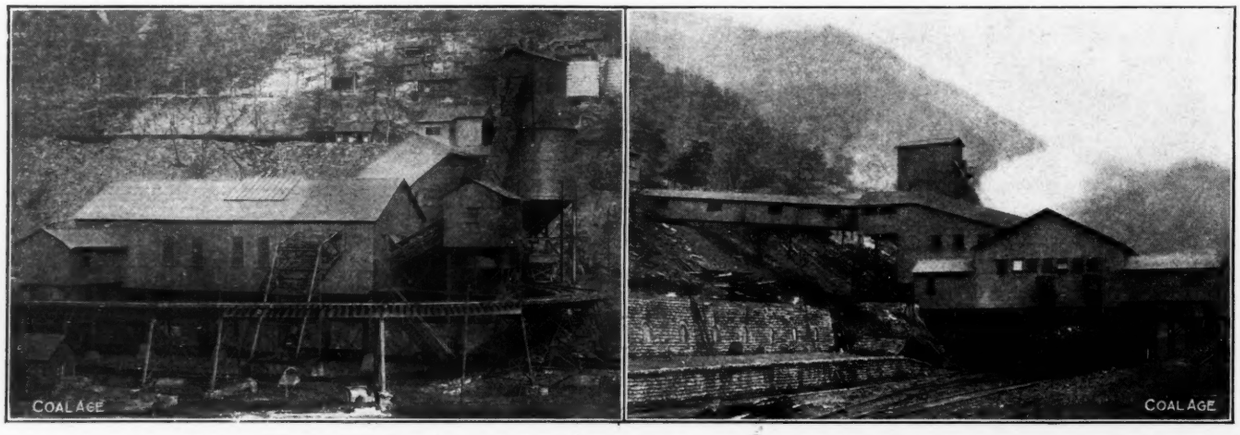
FIG. 2. CROSS-SECTION OF A TYPICAL STEAM COAL PREPARATION PLANT

SLACK IS EITHER SOLD OR MADE INTO COKE

The slack or fine coal from the under screen falls into a collecting bin or hopper, from which it is discharged into the railroad car or to a conveyor which carries it to a larger bin, from which it is taken to ovens for making coke. Provision is usually made in installations of this kind for conveying slack in sufficient quantity to the boiler house for power purposes, also for loading partially screened coal into wagons for delivery to the miners' houses for domestic fuel.

The handling equipment on the left is of the same general character except that no screening is provided for, the coal being loaded as it comes from the mine. This coal is largely used by the railroads for fuel, and by the larger distributing companies who maintain screening plants for retail purposes, in which case it is screened at the distributing center. The increasing use of stoker-fired locomotives is beginning to be felt in the trade, and it is probable that future installations will have to provide for at least enough screenings to meet these changing conditions.

It will be understood that the method of delivering



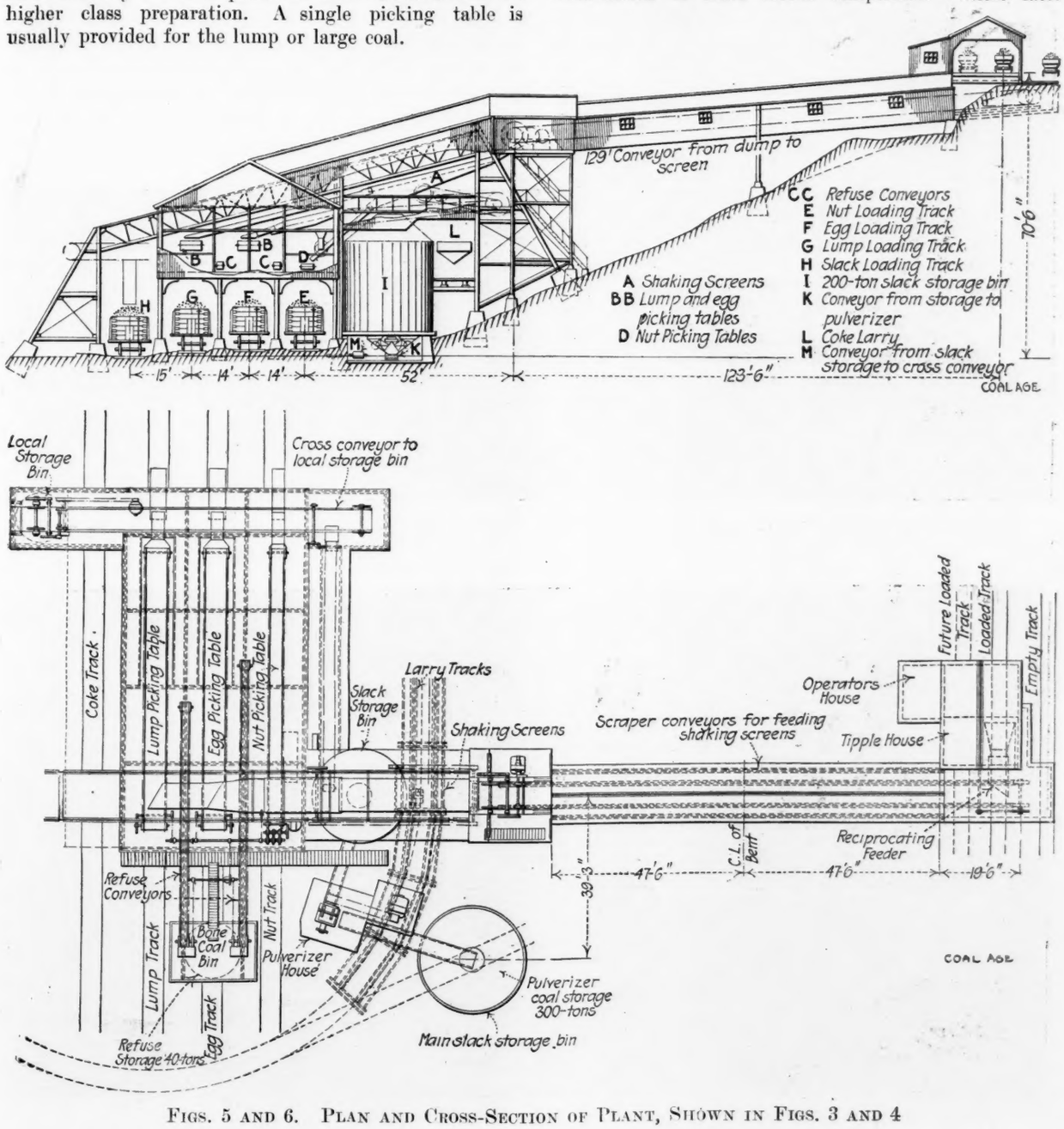
FIGS. 3 AND 4. TYPICAL PLANT FOR THE CAREFUL PREPARATION OF DOMESTIC FUEL

the coal from the mine to the screens varies with the local topographic conditions and the relative elevation of the coal seam and the railroad tracks. It is, however, becoming the general practice to dump the coal into a hopper at or near the mouth of the mine, from which it is conveyed to the screens. It was formerly customary to transport the mine cars to the screens, but this requires an expensive structure and complicates the operation of the equipment. The old method by which the coal was dumped in bulk into the screening equipment has been superseded by some method of feeding the coal at a uniform rate so that a better separation may be secured.

In the cases where cleaning of the coal is required it is taken care of in the manner described later. The picking or cleaning of fuel of this kind is not carried on so extensively or to a point of such refinement as in higher class preparation. A single picking table is usually provided for the lump or large coal.

The fundamental considerations in a plant for domestic preparation are to provide thorough screening or sizing, efficient cleaning and an adequate mixing of the various grades after preparation. The mixing is necessary so that any combination of sizes may be made to meet special combustion requirements. It also frequently happens that there is a large demand at high price for one particular size, while that for the other sizes is light, in which case the separation of all grades is made and the particular size desired is loaded separately, the others being mixed and loaded together. It will be understood that in order to properly clean the coal it is necessary to isolate it and pick the different sizes separately.

The plant taken as an example perhaps represents the highest development in this country, although there are installations of more recent completion. These later



FIGS. 5 AND 6. PLAN AND CROSS-SECTION OF PLANT, SHOWN IN FIGS. 3 AND 4

plants have, however, developed no new ideas and, in fact, have not carried the various operations to so high a point of refinement as the one to be described. It may be frankly stated that in the writer's opinion, the various operations are carried beyond the practical requirements of the trade at the present time, but the unavoidable expenditure was so great that the owners desired to anticipate future needs, since the life of the plant must necessarily be prolonged in order to justify the initial investment.

The question of handling the material so as to cause a minimum of breakage was given special attention, as the coal handled is rather soft and friable. Figs. 3 and 4 are general views of the equipment. The coal is dumped and conveyed to the screens substantially as described under the preceding section of this article. Figs. 7, 8 and 9 show a car dumping, the feeder and the conveyor.

The screens are what are known as "shakers" and consist of steel plates with different sized perforations built in a frame which is suspended either on hanger rods or rollers. This frame is connected to eccentrics which impart a reciprocating or shaking motion. It will be noted that these screens are on a much flatter pitch than the gravity type described above, the relation being approximately 15° to 30°. Fig. 10 shows the general construction and operation of screens of this class, but those

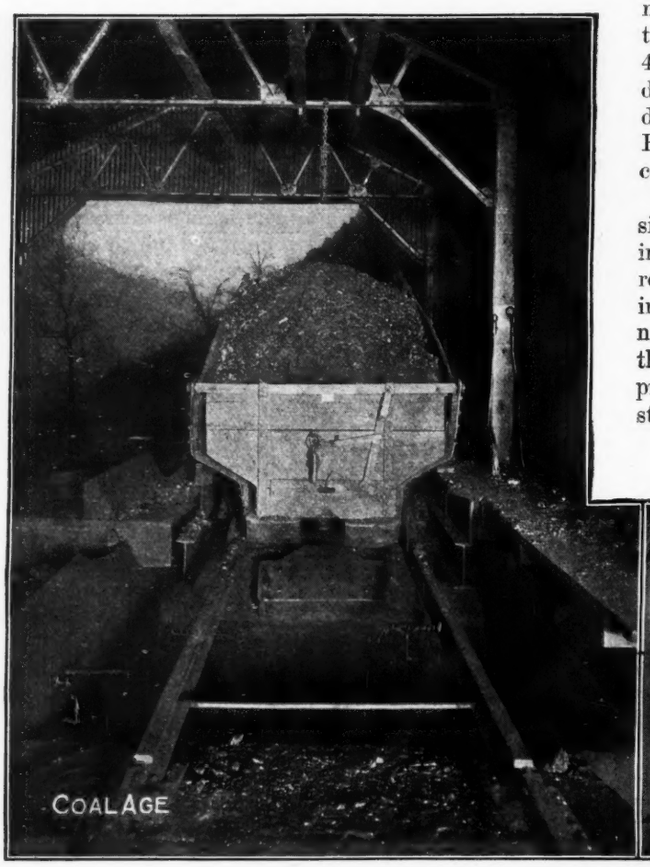


FIG. 7. A CAR ON THE HEAVY CROSSOVER DUMP

FIG. 8. RECIPROCATING FEEDER DISCHARGING TO CONVEYOR

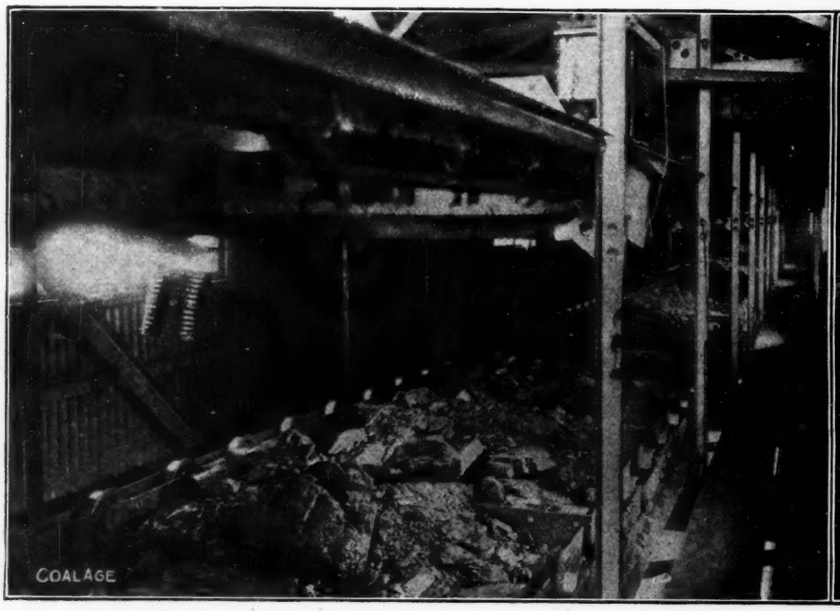


FIG. 9. GENERAL VIEW OF CONVEYOR

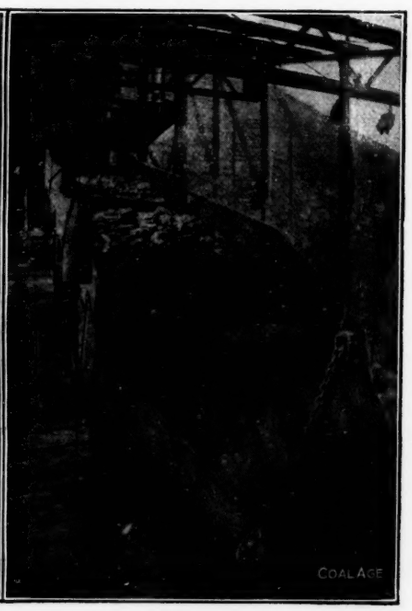


FIG. 10. THE SCREEN DISCHARGE

FIG. 11. LOWER END OF SHAKING SCREEN OVER PICKING TABLE

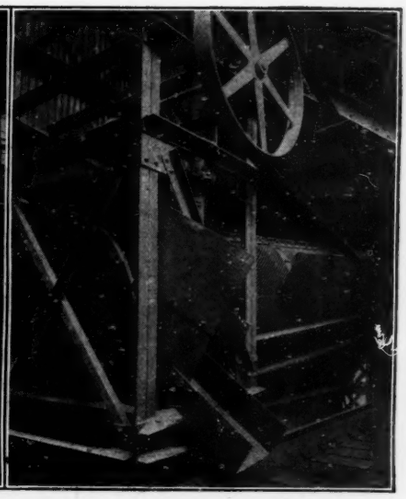


FIG. 12. REVOLVING NUT SCREEN

here illustrated are not a part of the equipment under discussion.

PICKING TABLES HAVE ADJUSTABLE LOADING BOOMS

The lump coal after passing over the screens is discharged onto a picking table, which in turn delivers it into the railroad cars. Fig. 11 shows the end of the screen discharging onto the picking table, which consists of a flat steel belt made up of overlapping plates mounted on roller chains at either side which travel at the rate of about 40 ft. per min. Fig. 13 shows the pickers removing the refuse, consisting of slate or bone, and depositing it in chutes leading to refuse conveyors under the floor, which deliver it to a storage bin over the railroad track. This refuse is loaded in railroad cars and used for filling purposes along the tracks.

The discharge end of the picking table is supported on a structural hinged frame or boom, which is attached to an electric hoist, thus providing a means of raising and lowering the discharge of the coal to suit the cars. A small adjustable chute with loading "fingers" is fitted to the end of the boom.

The introduction of the loading boom has had a wonderful effect in the reduction of breakage, as coal can be laid down in the bottom of the car with practically no drop or fall.

The egg coal is handled in the same manner as the lump and goes through a similar path to the cars. The nut coal, on the other hand, after being separated on the shakers, is rescreened in a revolving or rotary screen, as shown in Fig. 12, to remove any slack or fine coal which may have passed over with it, and is then delivered to a picking table, where it is treated in the same manner as the lump and egg, except that no loading boom is provided, the delivery to the cars being made by a fixed chute with an adjustable apron.

The slack from the shaker screens passes into a storage bin, from which it is conveyed to a pulverizer and pre-

FIG. 13. LOADING BOOMS AT END OF PICKING TABLES AND PICKERS REMOVING SLATE

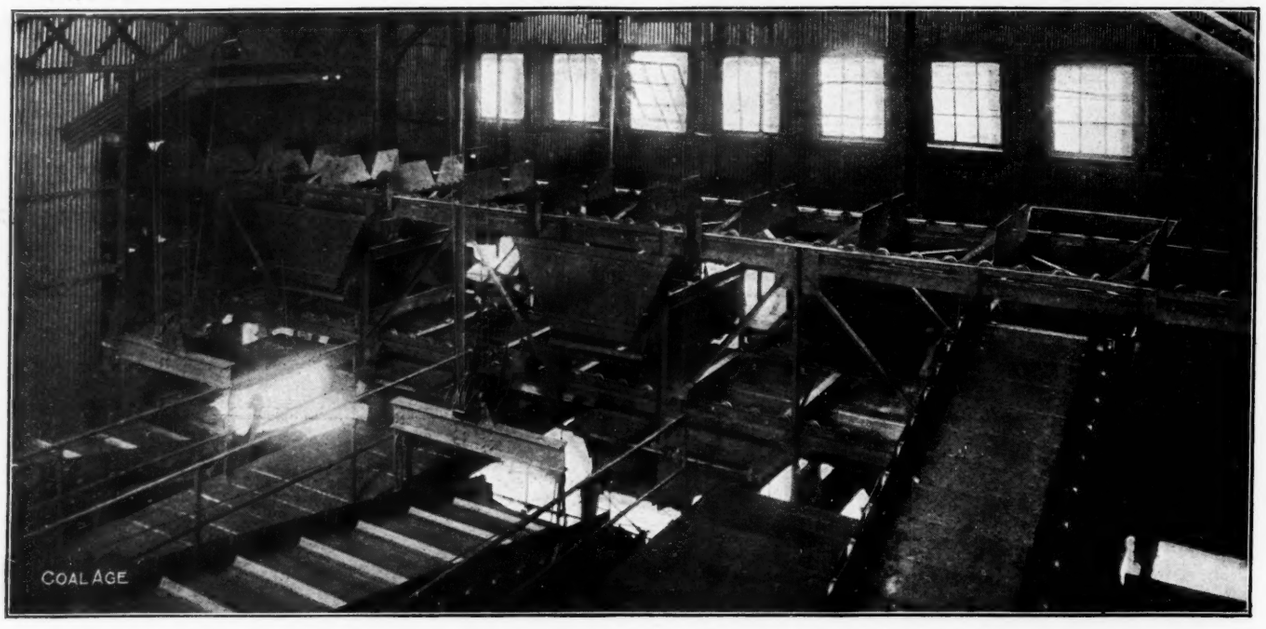


FIG. 14. THE TRANSVERSE MIXING CONVEYOR OVER THE END OF THE LOADING BOOMS

pared for making coke. An elevator carries it to a second storage bin, from which it is taken to the ovens. Provision is also made for conveying the slack to a point where it may be mixed with the other sizes or loaded in cars on a separate track.

The mixing of the different sizes after preparation is accomplished by means of a cross conveyor shown in Fig. 14, located at the end of the loading booms and the nut and slack conveyors. The booms are raised by means of the electric hoists above mentioned, and the slack and nut conveyors are arranged to discharge into this mixing conveyor, so that any combination of sizes can be made as desired. Provision is also made for discharging coal from this conveyor into a storage bin for wagon coal to the miners' houses.

The capacity of this plant is 5000 tons per day of 10 hours, with a maximum capacity of 750 tons per hour.

Fig. 15 illustrates a typical sizing equipment in connection with a retarding conveyor for delivering the coal to the screens, while Fig. 16 shows a similar installation in connection with a shaft mine.

In the Illinois field it is the general practice not to separate the nut and slack on the shaker screens, but to deliver the mixture to a rescreening plant, where it is separated into several intermediate sizes, which are stored in separate bins from which they may be loaded into the cars.

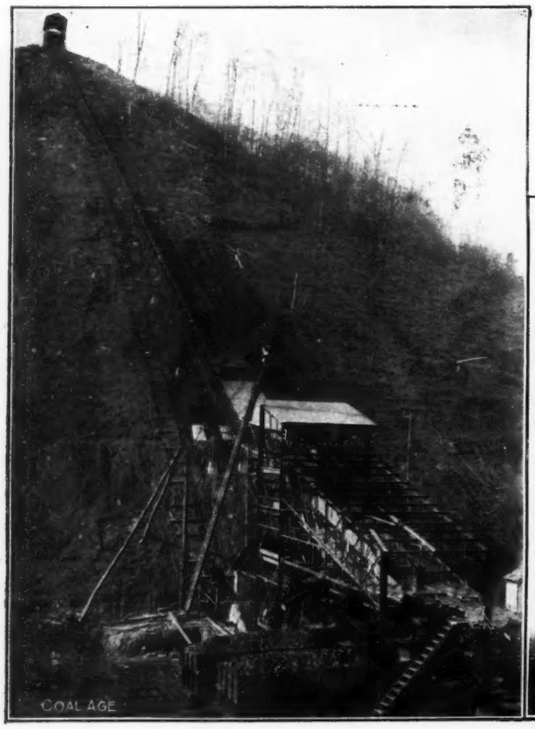


FIG. 15. A SMALL SCREENING PLANT AND A RETARDING CONVEYOR

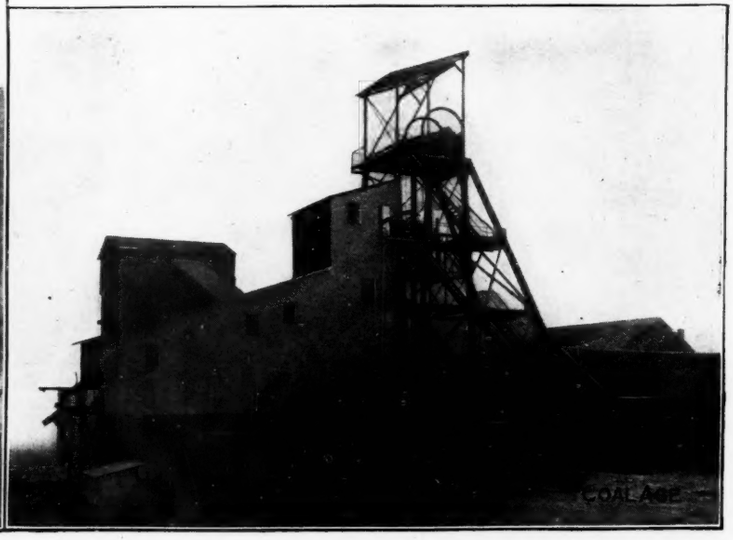
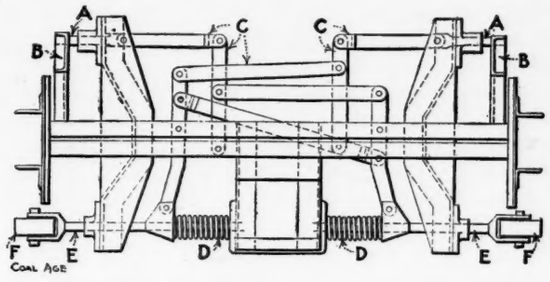


FIG. 16. A PREPARATION PLANT AT A SHAFT MINE

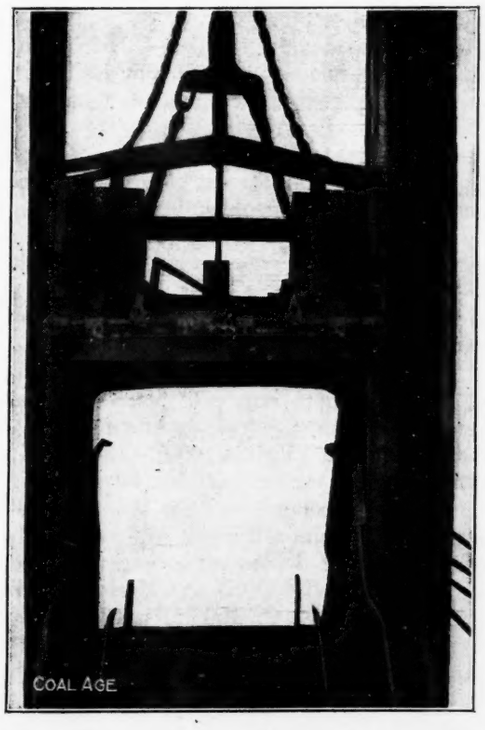
The Phelan Patent Safety Device

The Phelan patent safety device for self-dumping mine cages is essentially an automatic catch for preventing the cage from tipping in the shaft, or before it reaches its proper discharging position. It is so designed that the cage cannot tilt until the tip wheel enters the dumping guides at the proper point of the head frame.

Two forged steel pins *A* arranged to permit lateral motion engage at one end with each of the tip frame channels *B* and at the other end with a series of



Top View of Safety Device



General View of Safety Device Applied to Cage

levers *C* which are actuated by two amply large springs *D* mounted on steel shafts *E*. The spring shafts *E* have forged eyes which are designed to accommodate the 6-in. diameter rollers *F*. These rollers are held in the out position by the springs *D* which also retain the latches *A* in engagement with the tip frame channels *B*.

Upon entering or at the point of entering the tip guides, each of the rollers *F* comes in contact with a wooden track which is so shaped as to depress the rollers, compress the springs *D* and release the tip frame latch *A*, allowing the cage to dump. On the return trip the rollers are released by the track and the catches *A* are immediately forced into safety position by the springs *D*.

Aside from being an absolute preventive of accidents which frequently occur from the cage turning over in the shaft, this device should recommend itself to all users of self-dumping cages on account of the saving of wear on the guides. The catch relieves the tendency of the cage to overbalance and by holding the tip frame guide-plates away from the wooden guide-rails and throwing all the engagement onto the guide angles of the cage it proves a decided factor in preventing wear on the wooden guides in the shaftway.

The manufacture and sale of this device are controlled by the Scottdale Machine & Manufacturing Co., Scottdale, Penn.

Rules for Boiler Erection

The Inland Steel Co., in its Book of Rules, gives the following instructions for boiler erection, which apply rather to the operating forces than to the erecting gang:

(1) Boilers shall be numbered at both ends and on top. The numbers should be placed so as to designate the boilers to which they apply and should be large enough to be plainly seen. Numbers perforated in steel plates are recommended.

(2) Seamless tubing should be used in all boilers.

(3) Guards should be provided for water-gage glasses.

(4) Pop safety valves of ample capacity should be provided and piped through the roof or to the outside of the building. No stop valve should be placed between the safety valve and the boiler.

(5) To relieve pressure in the blowoff line, for each battery of eight boilers, or fraction thereof, a vertical pipe should be connected with the blowoff line and run up through the roof, or to the outside of the building.

(6) Two stop valves should be provided in the blowoff connection.

(7) Two valves should be placed in feed-water connections of each boiler, one on each side of the check valve.

(8) To avoid untrue indication of water level, and possibly an explosion, no valves should be placed in connections between water columns and boilers, or if valves are so placed they should be locked open when not in use.

(9) One of the two valves in the connection between the boiler and the steam header should be a nonreturn valve.

(10) Suitable drains should be provided where necessary on all steam lines.

(11) Walks or platforms, equipped with suitable stairs or ladders, should be provided, wherever possible, on boilers, steam header and other places where men have to work.

(12) When boilers are not equipped with nonreturn valves, a guard provided with a lock, designed to lock the steam-valve wheel, should be provided and used when men are working in the boilers, to prevent anyone from turning in steam.

(13) Plank covering over exhaust pits should be frequently inspected and kept in perfect repair.

Extracts from a Superintendent's Diary

Attempting to honestly enforce the laws which regulate the ages at which children shall be employed within the mines has kept me sitting on thorns for the past month. For a time we were not vigilant about this matter, but lately word has come out from our legal department that we are to assume no discretion in interpreting the law and the rulings from our legal department cannot be winked at.

Each father has a special reason for wishing to work his boy, but they all come under two classes: 1. The boy does not want an education and so would be better off at work. 2. The boy's wages are absolutely necessary to the family. When argument fails, other means are attempted, such as concealing the boy's age.

If I were entirely in sympathy with the law, the task would not be so difficult and I might even derive some pleasure in trying to outwit the law-breakers, but I haven't been able to convince myself that 16 years is in all cases a desirable age limit.

I realize that we mine superintendents are not considered good judges when it comes to deciding questions of sociology, so I have taken pains to read all of the arguments advanced by the defenders of the law and still it looks visionary to me.

They insist that until a child is 16 he is not competent to choose a congenial occupation and for that reason he ought not to be forced into work which cannot benefit him, but on the contrary tends to dull his intellect for all future time.

Today old man Powell came to ask my advice about what to do with his son. He is 18 now and has never done a stroke of work worthy of the name. The father, a miner of the old school, accumulated a fair competency at hard work, while the boy was still a youngster, and, like many miners similarly situated, decided to give his son an education and put him in one of the professions. He realizes now that the boy cannot or at least will not take an education, and likewise he will not go to work. Keeping at work is either a matter of habit or the outcome of a determination to accomplish something in the world. This boy has never been allowed to acquire the habit and his teachers haven't been able to give him a life vision.

If he ever develops into a sure enough man, it will be in spite of his father's planning rather than because of it.

And he's not very different from six or seven other young fellows of our town with whom he passes most of his time.

In contrast to them I see our boss driver's son, who has worked in the mine every day since he was 13. He's now 18. Next year he expects to complete the correspondence course he is taking, after which he has been promised a position in a machine shop that specializes on mine equipment. Suppose he fails to make good, he still has the working habit to fall back on.

If the boys who have come under my observation are fairly average, I should say that the ones who have passed 16 without having earned a dollar will have to depend upon their wits mostly if they succeed in the world, and if all of them are successful at that, surely the value of labor to the world has been greatly exaggerated.

Southern Appalachian Coal Operators' Association

The semi-annual meeting of the members of the Southern Appalachian Coal Operators' Association was held in Knoxville, Tenn., Friday, July 24, about 100 being present. Gov. B. W. Hooper was present to confer with the operators in reference to the demand which they have made for years that the 800 state convicts, now employed at the state mine, be removed and placed on the public highways. Tennessee employs a large number of convicts on a farm; several hundred are leased, at a low rate of course, to lessees using them in different lines of trade, but no more than 199 are ever employed in any one trade except coal mining. It will thus be seen that coal operators are subjected to discrimination.

The convict mine is one of the largest producers in the state, is therefore a factor in the market, and, worst of all, state coal is sold regardless of market prices, especially when the market is at its worst, thus making the demoralization of prices more complete. Operators have persistently endeavored to get the convicts out of the mines, but politics has prevented. At this meeting, however, Governor Hooper assured the operators that he was in favor of placing a large number of convicts on the farm and some at trades, but with the number to each trade limited, so that their labor would have but little effect upon similar trades. Other convicts, he thought, should be placed on the public highways.

However, he stated that the operators should endeavor to convince the public and members of the legislature, which meets next December, that the coal industry is being injured by the employment of convicts in the state mine; also that some plan must be made to dispose of the operation without a large loss to the state on its investment, which amounts to several hundred thousand dollars. The state owns a good property, fairly well equipped, and it is believed that the mine could be leased if not sold outright.

E. C. Mahan reported briefly regarding the progress of the general freight rate case before the Interstate Commerce Commission, in which are involved all coal freight rates between Virginia, West Virginia, Kentucky and Tennessee and all southeastern territory. All evidence is before the commission, the case is to be argued at a date to be set, and a decision will probably be given in the latter part of September or early in October.

Under the leadership of B. A. Morton for the first three years and of E. C. Mahan, who now serves his second term, the Southern Appalachian Coal Operators Association has succeeded in getting a large majority of the coal operators of the Tennessee-Kentucky field to work together for the common good. This has been especially true in handling freight-rate cases and in the securing of credits and collections, many operators saying that the latter department has saved them many times the cost of membership and dues. Members' meetings are held quarterly, while domestic operators have frequent informal conferences during the season. The headquarters of the association are in the Holston National Bank building, in charge of the secretary-treasurer, J. E. McCoy. His offices adjoin those of the president, E. C. Mahan, who is general manager of the sales department of the Southern Coal & Coke Co.

Care of Rubber Belts

SYNOPSIS—Notes on splicing big and small belts so as to promote long life and smooth running. Square and diamond lap joints and those with a back splice are described. The writer points out the severe strain to which a thick belt is exposed on a small pulley.

Some valuable kinks in the handling and splicing of rubber belts are given by Robert Moore in *Power*. Care must be taken in putting on a new belt to stretch it as much as possible before splicing.

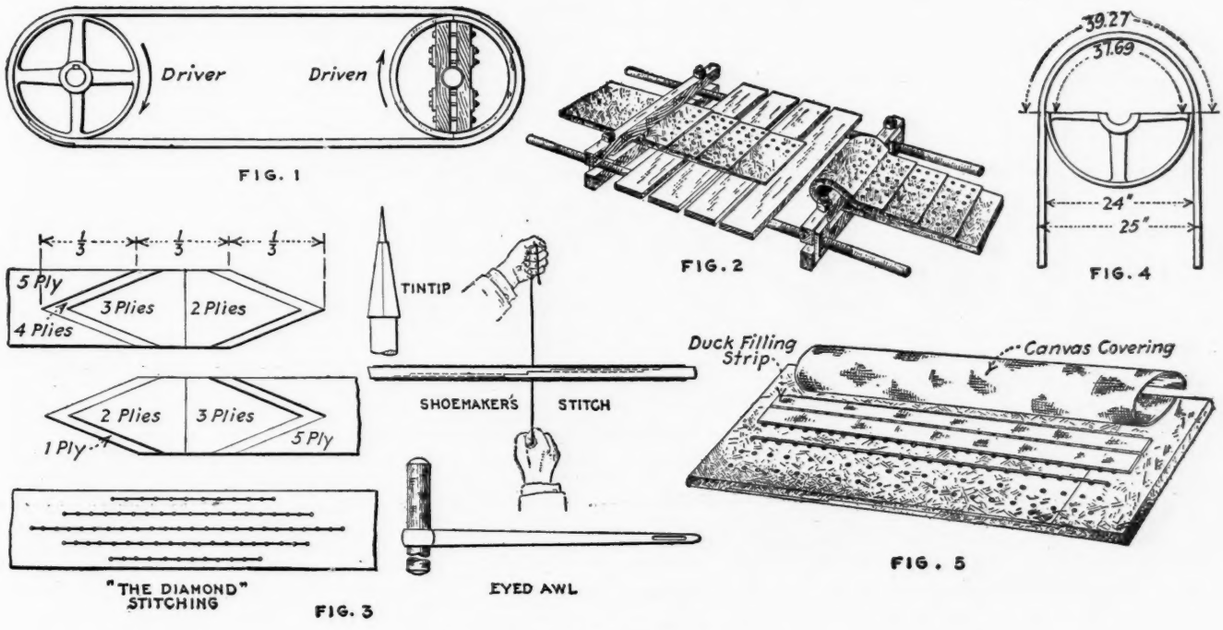
In placing a 36-in. eight-ply rubber belt on pulleys 50 ft. between centers, allow ⅛ in. per running foot for stretch. Put on the clamps, as shown in Fig. 2, and draw them tight. Do not be afraid of breaking the belt, as even a five-ply 10-in. belt will stand a strain of 10,000 lb. and larger ones in proportion; the pulley will collapse first. Take all the tension the bearings will stand, then turn the shaft slowly back and forth until the clamps touch the pulleys; taking up the slack as it is recovered from the upper half. Neglect to do this will stretch only one-half of the belt, and is apt to cause it to run out of line.

Preparing the Lap

After thoroughly stretching, proceed with the lap, which in this case should be 45 in. long. It should always point in the direction of travel over the pulley, as in Fig. 1. Thus any slip of the pulley will have a tendency to smooth down the lap. Place a board on the clamp rods on which to rest the splice and draw a line squarely across the belt 47 in. from the end. Lay the section off in 2-in. squares, starting 1 in. from the outer edge, as in Fig. 2. Punch ¼-in. holes where the lines cross. As there are eight plies, there will be three cuts or scarfs. Cut a line just the depth of two plies at the 45-in. line and peel off these two thicknesses; do the same at the 15- and 30-in. lines.

Cementing and Sewing the Lap

Scarf the other end, place the halves together and punch holes in the lower half, inserting the punch in the holes in the upper half. By so doing, the holes will be directly opposite each other. Cleanse the surfaces with naphtha and apply a liberal coating of the best rubber cement. Allow this to dry until it will not stick to the fingers, then place the laps together, starting at the edge and rolling the upper one out as it is being cemented, so that air may not be entrapped between the surfaces. Sew the outer edges, using the shoemaker's stitch, shown in Fig. 3. Alternately roll and pound the joint until it is perfectly flat, then sew each row of holes as was done with the outer ones.



Methods of Stitching Belts

Cut filling strips of duck the width of the spacing between lacings (most belt companies sell this duck all prepared) and give them several coats of rubber cement on each side. Clean the face of the belt between the laces with naphtha and give it a liberal coating of cement. When each surface is dry, that is, when the finger placed lightly to the surface will not adhere, place the strips between the lacing and roll them down. Now take a piece of duck, the width of the splice, but 4 in. longer, and cement this to the face of the belt, covering the joint. By so doing the lacings are protected and, except for the occasional renewal of the outer covering the joint is as durable as the belt itself. The manner of this is shown in Fig. 5.

For sewing, tip the laces like a shoe string by bending a V-shaped piece of tin around the ends, as illustrated, or use the eyed awl shown, to pull the lace through.

Small Belts Are Butted

Belts smaller than 10 in. are butted and have a butt strap on the outer surface; this is known as the "back splice." Belts on grindstones, saws, rattlers, etc., where shippers are used will wear on the corners where they are butted, and the outer lace hole will soon tear away, if this form of joint is not used. Shippers for belts of this kind should always be of the roller type. In joining canvas belts always stagger the holes and do not have them less than 1¼ in. apart as the fabric is apt to crack across in cold weather.

The Diamond Splice

Another form of joint, known as the "diamond splice," is used on generators with small pulleys, as there is less shock when the lap passes over the pulley, eliminating all flicker of the lamps when generating power for a light circuit. The diamond splice is made in much the same manner as the lap splice except that the scarfs are divided into three equal parts and cut as shown in Fig. 3; it is not so strong a joint as the lap splice, but is more flexible and, therefore, better adapted to small pulleys.

Why Small Pulleys Are Undesirable

Increasing the diameter of the pulley lengthens the life of a belt, as the stretch and compression are less per foot. As the thickness of the belt increases, so should the diameter of the pulley increase. For instance, the arc of a belt ¼ in. thick on a 2-ft. pulley would measure 37.69 in. next the pulley face, while the outer edge would measure 38.48 in., a total distortion of 0.79 in. If the belt were ½ in. thick the outer edge would measure 39.27 in., giving a total distortion of 1.58, just twice as much (Fig. 4). When more power is wanted and it is not advisable to increase the size of the pulley, better results are obtained by widening the belt and pulley face than by increasing the thickness of the belt. To increase the diameter of the pulley to 48 in. would give a total distortion of 1.58 in. when using a ½-in. belt, but as the arc would measure 75.4 in., the distortion for each lineal foot would be halved.

Animal fats and grease should never be used on rubber belts. Boiled linseed oil is good; also equal parts of black lead, red lead, French yellow, litharge and enough japan dryer to make it dry quickly. This will give a smooth, polished surface.

The Gary, W. Va., Gardens

The U. S. Coal & Coke Co., of Gary, W. Va., made their annual awards of premiums for the best kept yards and gardens at their various plants, on July 21 and 22. A committee of four, was selected for making the awards, consisting of Dr. E. A. Schubert, traveling agent, Agricultural & Industrial Department, Norfolk and Western R.R. Co.; Jesse M. Jones, field agent, Department of Agriculture, Washington, D. C.; Dr. T. C. Atcheson, Agricultural Department, University of West Virginia, Morgantown, W. Va., and W. H. Kendrick, state agent, Boys' Agricultural Clubs, in connection with the University of West Virginia.

The prizes given were the same as in former years, namely: $10 for the best kept gardens and $5 for the second best kept garden; and $5 for the best kept yards, at each of the twelve plants of the company. The awards for carefully kept yards went to 6 Hungarians, 3 Americans, one Slav and one Italian. The awards for good gardens were granted to 5 Hungarians, 2 Americans, 2 Italians, one Roumanian and a negro. The gardens were better than ever before despite the dry weather in May and June. The committee found at least 1000 gardens on the property of the company worth, in aggregate, at least $40,000.

A Fine Coal Year in Virginia

The production of coal in Virginia in 1913 was 8,828,086 short tons, valued, according to E. W. Parker, of the U. S. Geological Survey, at $8,952,653. Virginia broke all previous records during this year in the quantity of coal produced, and for the first time in six years the value of the output per ton exceeded $1.

The quantity of coal produced exceeded that of 1912 by 981,430 short tons, or 12.5 per cent., with a gain in value of $1,434,077, or 19 per cent. The quantity of coal mined by machines increased a little over a million tons. The average number of working days was exceptionally large, while the average production per man reached nearly 1000 tons for the year.

The bad practice of shooting coal off the solid was reduced to the extent of nearly a million tons, compared with 1912. The number of fatal accidents was lowered by a little more than ⅔, and there was not a single strike or lockout reported. This record bears on its face the evidence that the year was exceptionally gratifying.

For several years Virginia has stood relatively high in the coal produced by each man employed, and 1913 was no exception to this rule. The number of men engaged in the coal mines of the state increased from 8678 in 1912, to 9162 in 1913, and the average working time from 251 to 280 days. The average production per man in 1912 was 904 tons, and in 1913, 963 tons. The average daily production per man was slightly less in 1913, being 3.44 tons against 3.6 tons in 1912.

The most gratifying part of the record of 1913 was in the reduction of the number of fatal accidents. In 1912, 75 men were killed in the coal mines of Virginia, and in 1913, there were but 24 fatalities.

Lignite Deposits in North Dakota

Few parts of the United States have enjoyed a more rapid agricultural development than the region along the North Dakota and South Dakota state line, from the Missouri River westward.

In the settlement of this region, lignite has proved a great boon. The country is mainly treeless, and homesteaders are, as a rule, of scanty means, and the lignite is practically the only fuel available.

This region was recently examined by the U. S. Geological Survey, which found that the lignite beds are, for the most part, thin and of little value, but will furnish considerable fuel for local use. In many places, these measures are not over 18 in. thick, but have been mined for local use by stripping off the overburden of shale and sandstone.

In some parts of the field examined, the lignite beds are much thicker, in one place as much as 13 ft. Here mining is carried on by drifts, and, in one instance, by a shaft. The most important mining centers at present are near Haynes, on the Chicago, Milwaukee & St. Paul Ry., in Adams County, and near Leigh on the Cannon Ball Branch of the same road in southwestern Morton County.

The government report on this field, containing maps showing the distribution of the lignite and a general description of its quality may be obtained from the Director of the U. S. Geological Survey, Washington, D. C.

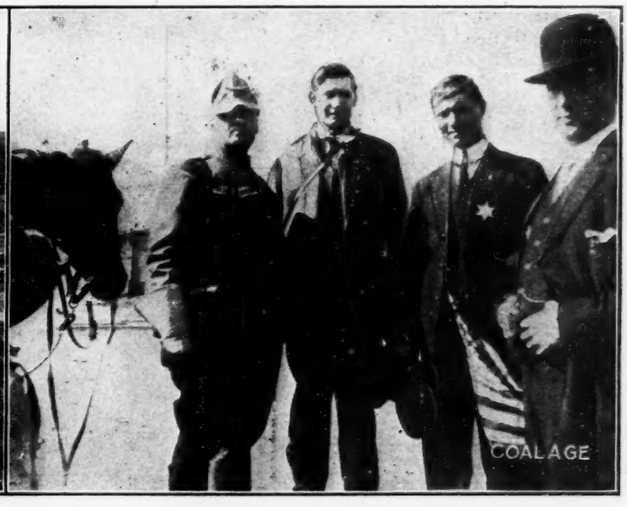
The Militia in the Colorado Labor War

SYNOPSIS—The militia of Colorado has been freely condemned by partisans and unthinking people. The Ludlow battle has been described as an attack by an overwhelming soldiery on an unarmed people, whereas it was simply the successful defense of a greatly depleted force of militia fighting against a rabble of southern Europeans who had learned that the troop they had to meet was ill able to protect itself. This attack was made in the face of a promise that violence would not be committed. Acting on this assurance the few troops still in the field were being withdrawn.

The newspapers have declared that women and children were burned, and shot down by the National Guard of Colorado or by the mine guards at Ludlow, but this is wholly untrue with but one possible exception. One boy, who rushed in between the brave defenders of the state and the serried ranks of armed anarchy, was killed. It is not impossible that the boy's death may have been due to a bullet from the guards.

Judge Ben. B. Lindsey stated in Chicago that the boy was beheaded by the militia and that the head was hurled at the boy's father when he asked for the body. After Governor Ammons had branded the story as false Judge Lindsey sent a feeble denial of the interview in which this statement was made.

THE MILITIA IN ACTION ON WATER-TANK HILL NEAR LUDLOW, COL.



MAJOR WILLIAMS, JOHN LAWSON, LOUIS TIKAS AND A CITIZEN

THE FACTS ABOUT LUDLOW

Instead of Ludlow being the scene of a massacre it was rather the setting of a deep-laid plot by leaders of trained Greek soldiers, fresh from the Balkan war, to massacre a detachment of 44 national guardsmen left in the field for a day or two after the order of recall by Governor Ammons. The story of the gallant defense of their position against ten times as many men who had either been hired by the United Mine Workers of America to murder the guard, or who had gotten beyond the control of that organization, will compare in heroism and fortitude with the defense of the Alamo against the Mexican army. In position to mow down their enemies as they deployed over the level land from the tent colony to the railroad cut, this handful of guardsmen obeyed the order of Major Hamrock not to fire until fired on and permitted the armed enemy to gain cover from which they could fire on the uniforms and against the sovereignty of Colorado.

Six of these guards were boys of 18 years of age, students of Colorado colleges. Governor Ammons had called home the main force at Ludlow, and these were left to gather up the camp equipment and stray cavalry horses. But another week and General Chase would have had them out and on their way home. Governor Ammons had recalled the troops, under a pledge of peace arranged by John R. Lawson, Executive Committeeman of the United Mine Workers, specially in charge of the strike by orders from Indianapolis, and by other officers of the United Mine Workers. Beset by disloyalty in the State Capitol and a powerful and venal press in the city of Denver, harassed by the fact that the state was without funds to carry on the public defense, and suffering from attacks of illness, Governor Ammons listened to the promise of the strike leaders and the advice of powerful public men and private citizens, and agreed to remove the troops and did so—only this little detachment remaining in the field.

THE "STRIKERS" AND THE MILITIA

But the situation is best approached by recalling some events prior to the Ludlow battle. When the troops arrived in the disturbed district, Oct. 29, 1913, the strikers encouraged by their leaders had the hypocritical grace to welcome them. The strikers were afraid or pretended to fear the handful of mine guards engaged by the coal companies. Every train was adding, to the numbers of "strikers," men who had left Colorado a year or two ago to fight in the Balkan war or other gun men hired to become "miners" or "strikers." Many of them, like Louis Tikas, the Greek, the proprietor of a bootblack establishment in Denver, had never done a day's work in a mine. Already Robert Lee, marshal of Segundo, had been killed by strikers and numerous parties beaten up. The sheriffs and other officers of the counties had appealed for troops, saying they were unable to preserve life and property against the attack by the United Mine Workers of America.

DESTRUCTION OF SOUTHWESTERN MINE

Adjutant General John Chase established Trinidad and Walsenburg as his bases. On the night of the arrival of the troops, a band of men went to the Southwestern mine, an independent plant owned by J. W. Siple, H. D. King and John Vail, citizens of Colorado, poured oil on the tipple and mine buildings, set them on fire, and destroyed the property. After a long time arrests were made for these acts of arson, but the activity in prosecution was only because the post-office at the Southwestern mine was destroyed at the same time as the town and mine and the federal authorities were

Note—This article is based on one by L. C. Paddock, which appeared in the "Daily Camera," of Boulder, Colo. The illustrations are from photographs furnished by him for our columns and are the same as appeared in the publication mentioned.

the parties which acted. The district attorney of Las Animas county, either through fear or from his strike sympathies, had neglected to do anything.

The Southwestern was not a John D. Rockefeller property and the improvements valued at $60,000, were expended on it by Mr. Siple and his associates. All this went up in flames, entailing a total loss of surface improvements, flooding the mine with water, and necessitating great future expense in restoring the property to working condition.

THE FOREIGNERS KEPT THEIR GUNS

General Chase, moved by the assurance of Lawson and others that they would disarm their followers as soon as the mine guards were disarmed, proceeded to take the arms of the latter. This was easily done, as he says in his able report to the congressional committee, "Upon the Occupation of the Coal Strike Zone of Colorado."

"They were assembled by their employers and promptly turned over the high-powered rifles." . . . "I disarmed the mine guards and the employees of the operating companies in every camp throughout the entire strike zone, and speedily and easily finished the complete disarmament of that side."

General Chase was promised specially by Lawson that the strikers would now surrender their arms. Troops were marched to Ludlow—the largest tent colony in the strike district—and they were received with open arms, but those were not the arms which were wanted. He continues: "Many of the men were in the strange costumes of the Greek, Montenegrin, Servian and Bulgarian armies." Gen. Chase's report did not include the battle of Ludlow and other terrible affairs occurring after the withdrawal of the troops, but that he had prescience of what would occur is shown by this passage:

"We passed by Ludlow, occupied the Berwind and Hastings canons, and then returned to the colony to receive the surrender of the hundreds of high-power rifles I knew the strikers possessed. At this point occurred the first instance of bad faith on the part of the striking people. Expecting to receive hundreds, if not thousands, of arms, there were delivered into my possession some twenty or thirty weapons, many of them of obsolete pattern, the strikers topping off the humor of the situation by including in the delivery of arms a child's toy pop-gun. Since that time the recovery of the strikers' arms has been attended with the greatest difficulty; it has been a game of hide-and-seek, and while I have been able to recover, from various hiding places, a large number of high-power weapons belonging to the union, I will state that there are hundreds of guns still concealed and waiting occasion for use. Such weapons as I have received from this source came in always a few at a time."

THE ATTACK ON UNARMED GUARDS

The troops were called into Trinidad on Oct. 31 to prevent the massacre of the mine guards who had been disarmed by General Chase, who assembled them at the Coronado Hotel preparatory to giving them safe escort out of the district. A great crowd gathered, threatening vengeance on the disarmed guards. Five or six hundred of the mob were there, and made no secret of their determination to "get" these unarmed men. General Chase says:

"Notwithstanding the promises of Mr. Lawson and other strike leaders which induced me to disarm the mine guards, they then rather gleefully assured me that they could not control their people and that the feeling among the strikers, thirsting for the blood of the mine guards, was such as could not be stayed by any influence of the leaders."

He ordered out infantry and cavalry on the streets of Trinidad and quelled an ugly riot. Against General Chase's statements are those of men imported to Colorado to stir up the spirit of class hatred, men imported to make this state the battle ground of international warfare upon society and rights of property.

GENERAL CHASE

And who is Chase? Leader of the citizen-soldiery in times of strife—he is a specialist in the treatment of the eye and ear, widely known for his skill in medicine and surgery; an occupant for a number of years of a chair in the State University Medical College; a man of scholarly attainments, of life-long devotion to the poor, to whom by the thousands in Colorado he has rendered professional services without pay—a builder in the times of peace and a soldier, every inch of him, in the time of war; a tender-hearted physician, a devoted and loving husband and father, and citizen who is peer to any other. The imperfect pacification of the coal regions was due to no fault of his.

The troops who were in the field were but few—600 at times, never more than 1200, and the territory they were compelled to pacify and hold in check is larger than the State of Connecticut. That so small a band did such successful work while it was in force in the field is a credit to its efficiency and energy.

THE PIT AT LUDLOW UNDER A TENT IN WHICH THIRTEEN WOMEN AND CHILDREN WERE SMOTHERED

TROOP OF NATIONAL GUARDSMEN WITH MAJOR HAMROCK IN COMMAND AT EXTREME RIGHT

To Seek Northern Coal

Mackenzie & Mann, of the Canadian Northern Ry., are equipping the schooner "Laddie," at St. John's, Newfoundland, to sail for Hudson Bay on a prospecting expedition in search of coal deposits. They wish to secure coal supplies in that area for utilization in connection with the Hudson Bay railroad now being built from Le Pas, Manitoba, to Port Nelson.

The Canadian Northern has a junction with the Hudson Bay road at Le Pas, and will probably also operate the latter railway when it is completed. The discovery and opening up of coal deposits in the Hudson Bay re-

gion would be of great importance in connection with the traffic expected to be developed by the new route. At present all the coal required by the steamship traffic to the Bay has to be taken there from Sydney, N. S., in sealing vessels. The coal required for railway construction has to be brought up via Winnipeg and Le Pas.

Provision will be made at Port Nelson for the storage of coal in large quantities, but the cost of freight from the present distant sources of supply will be heavy and the finding of coal deposits at any point comparatively accessible for ships plying on the Hudson Bay route would be of immense advantage.

A Great Coal-Stripping Operation

The accompanying view, which shows two steam shovels, is of the Elsworth-Klaner Coal Co.'s coal-stripping works, four miles south of Pittsburg, Kan. This is the most remarkable picture ever taken of the comparatively new industry of open-cut coal mining. It shows, besides the extensive works, the two largest steam shovels in the world. They are Marions, model 270, and were built especially for this work.

STRIP PIT OF ELSWORTH-KLANER COAL CO., PITTSBURG, KANSAS

Compare the size of the giant shovel in the foreground with the string of cars or the two dinky engines. From the shovel in the foreground to the one farther back, it is a quarter of a mile.

The main booms of these shovels are 90 ft. long, and the dipper handles are 54 ft. long. The dippers, level full, will hold 5 cu.yd. of earth. and heaped up as they actually are at work, they hold 6 cu.yd., or 162 sq.ft. The shovels will plow a swath, at the beam's fullest swing, 105 ft. wide—will clean the coal for that distance. They each will strip a 30-ft. covering from an acre of coal in a month, and do it right along. They have been in operation nearly two years.

The shovels weigh 300 tons and cost $35,000 each. The freight on each one was $3000, and it cost $2000 to set them up and start to work. A crew of four men on the shovel and two ground men are required to run them. The coal they strip is from 3 to 3½ ft. thick. The picture was taken from the tipple.

Firebrick Work

Writing in *Power,* Frederick L. Ray gives the following specifications for firebrick work:

All firebrick shall be protected from moisture, and shall be dry when used. Each brick shall be dipped in a thin fine clay wash, rubbed and shoved into its final place, and then tapped with a wooden mallet until it actually touches the brick below it. The use of clay thick enough to lay with a trowel will not be permitted.

The walls of fire and red brick shall be carried up together. Furnace linings shall be laid with four courses of headers and then one stretcher backed by a firebrick header. Furnace center walls shall be of solid firebrick. Walls with 4½-in. linings or all red brick walls shall be laid with each header course on the inside of the wall lapping over a header course in the center of the wall, which in turn laps above a header course on the outside.

Points to Be Observed in the Building of Fire Arches

If fire arches are called for by the drawings, the skewbacks shall be laid off parallel and at the same height with a straight-edge as long as the arch. The skew shall be a true surface, cut only on the ends of the brick. There shall be firebrick back to the buckstays on single settings, and entirely through the center wall on battery settings.

Batten strips for the arch centers shall not be more than 2 in. wide. Selected brick only, smooth, straight and uniform, shall be used in the arches. Brick shall be laid dry without any clay; and shall be shoved together close and tapped with a wooden mallet on the flat side only of the brick. They shall be laid in courses along the arch center, beginning at the rear end of the arch, not in rings, and with every joint broken, and with a bond equal to one-half of the brick.

The first course shall start at the skewback on each side with a standard brick 4½ in. wide; the second at each side with a "flat back" 6½ in. wide; the third course 4½ in. and so on. To finish the courses at the front wall, a "flat back," cut to suit when necessary, shall be used. Each course shall be tried in place dry, and shall be checked with a straight-edge to insure all the brick of one course being the same thickness.

Bricks not of even thickness must be cut and rubbed. A course of wedges shall be used only when necessary to keep the bottoms of the straight brick in even contact with the arch center. If the use of wedges does in every case bring a straight brick to an even bottom the straight brick should lean away from the center of the furnace rather than toward it.

The Keying Course Should Be a Trifle above Arch Ring

A trial ring shall be laid, when about two-thirds of the arch has been completed, to determine if the keying course will fit. If cutting is necessary to fit the keying course, the key brick shall not be cut, but instead, the two adjacent courses on the side of the brick away from the key. The keying course shall be a true fit from top to bottom, of such thickness that when driven it shall not be below the surface of the arch, and shall preferably stand about ¼ in. above it. The keys should drive from 1 to 2½ in.

After fitting, the keys shall be loosely replaced, and then with a piece of wood, at least 2x4 in., extending the full length of the keying course, shall be driven uniformly to place with a heavy hammer, used along the entire length of the timber. After driving, the keys shall not show any crushing. When keyed up the top of the arch shall be thoroughly washed with a thin fireclay wash.

Centers shall be built so that they can be dropped down free of the arch after it is keyed, and removed from the setting without being burned out.

Itinerary of U. S. Mine Rescue Car No. 3

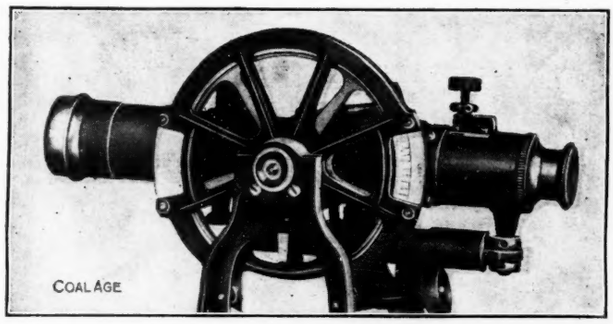
Arrive	Leave	Address
Aug. 17	Aug. 23	Paxton, Ind.
Aug. 24	Aug. 29	Sullivan, Ind.
Aug. 31	Sept. 5	Shelburn, Ind.
Sept. 7	Sept. 12	Clinton, Ind.
Sept. 14	Sept. 19	Terre Haute, Ind.

The New K & E Stadia Circle

The subsequent computations necessary to reduce observed stadia readings to the correct horizontal and vertical distances have long been a source of trouble and labor to the surveyor. Many arrangements, such as charts, tables and slide rules, have been devised to minimize this work, but all have been somewhat complicated and have presented a fruitful source of error. For this reason, stadia measurements have not found the universal application which their accuracy and convenience would presuppose.

In the new K & E stadia circle, an arrangement is presented which will undoubtedly stimulate the use of stadia measurements in all branches of surveying. Not only does it facilitate the taking of field notes, but it reduces the calculations of these notes to the simplest arithmetical processes, and, furthermore, the arrangement does not encumber the instrument with complicated and delicate equipment.

The usual method of taking stadia measurements is to observe the interval intercepted on a rod by the stadia hairs and the angle of depression or elevation of the telescope. With this data the observer is then enabled, by using the formulas $H = S \cos^2 a$ and $V = \frac{s}{2} \sin 2a$, to compute the correct horizontal distance and elevation of the point in question. The mechanical



The New Keuffel & Esser Stadia Attachment

means devised for the solution of these formulas have greatly simplified the plotting of notes, but their use still involves considerable labor and necessitates the carrying of extra equipment into the field.

Description of the Device

The K & E stadia circle is a modification of the regular transit circle whereby the degree graduations on two opposite segments are replaced by special graduations which give directly the per cent. of the observed stadia distance represented by the horizontal and vertical components. The accompanying illustration shows the simplicity of the new arrangement.

Through an arc of approximately 60 deg. at the right- and left-hand sides of the circle, the degree graduations are replaced by the special stadia graduations. At the index marked "Hor." is read the percentage factor to be applied to the observed stadia distance to obtain the correct horizontal distance. At the index marked "Vert." is read the percentage factor to be applied to the observed stadia distance to obtain the difference in elevation between the rod and instrument. Complications in the

calculations are avoided by bringing the center cross hair of the telescope to the target or mark on the rod, which has been placed at the instrument height before reading H. and V.

Example—Suppose the observed stadia distance to be 480 ft., and the telescope, when sighted on the target, to be inclined at such an angle that the reading at the Hor. index is 0.97 and at the Vert. index 0.17. Then *the correct horizontal distance* would be $480 \times 0.97 = 465.6$ ft., and the *difference in elevation* would be $480 \times 0.17 = 81.6$ ft. The very simplicity of this arrangement would seem to raise doubts as to its accuracy, but the position of each special graduation is theoretically correct, and exhaustive tests of the instrument throughout the full range of the stadia graduations have proved it to be practically free from error.

Over a long series of tests by different observers, the average error in the reading of the horizontal correction factor was found to be 0.05, which in a 500-ft. sight would introduce an error of 0.25 ft. in the computed horizontal distance. The same trials applied in the reading of the vertical correction factor disclosed an average error of 0.02, which in a 500-ft. sight would introduce an error of 0.10 ft.

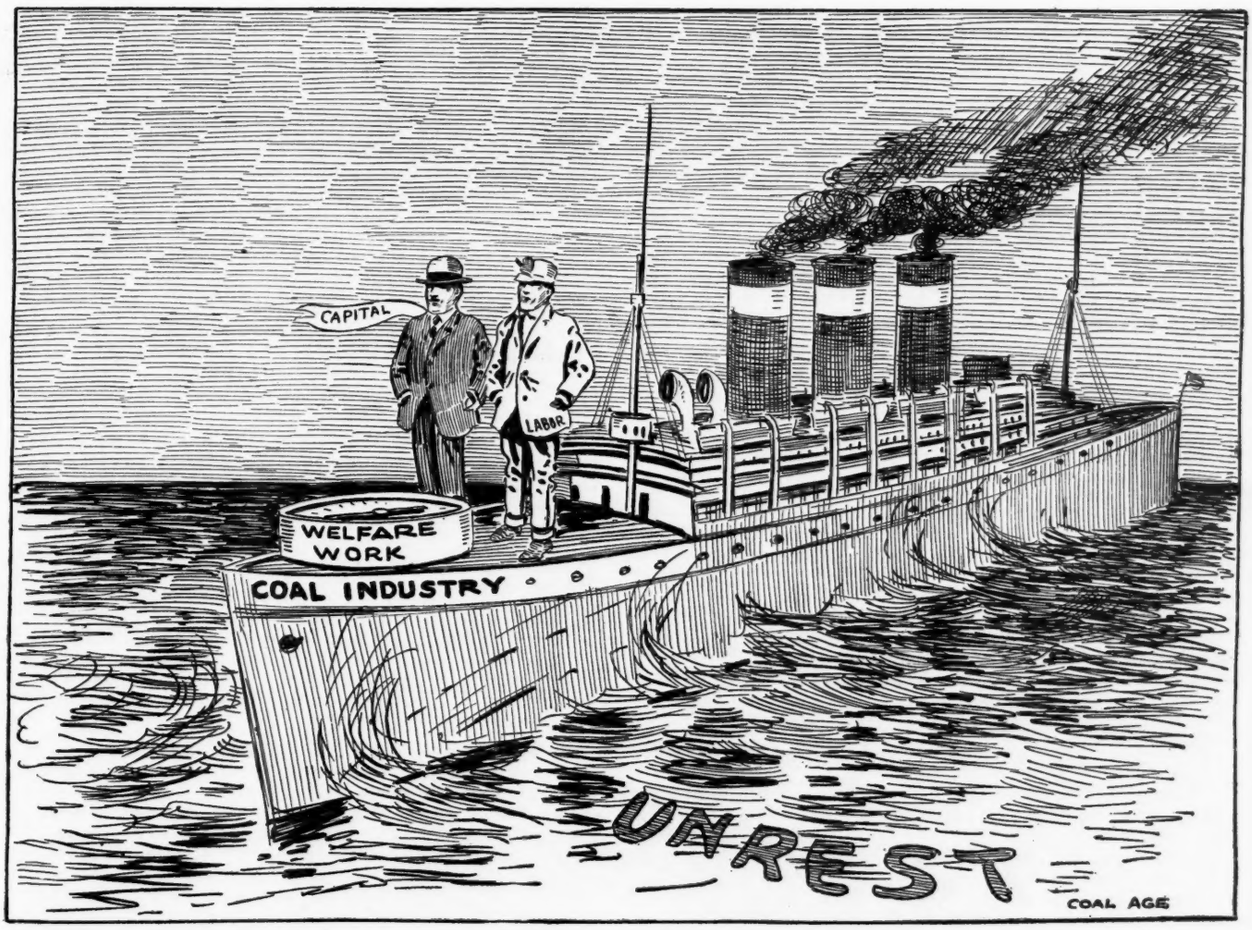
By the method of least squares the average error in reading was computed to be:

Vertical ± 0.07
Horizontal ± 0.09

These larger errors, in a 500-ft. sight, would affect the computation of the horizontal and vertical distances by ± 0.45 and ± 0.35 ft., respectively, and as the allowable error in stadia work is 1 per cent., it will be readily seen that this compares favorably with any method now used.

The greatest advantage of the device, however, lies in the rapidity with which field notes and the subsequent calculations can be made.

When dealing with a mine fire—Promptness is the cardinal virtue. An incipient blaze may sometimes be beaten out with a coat, cap or shovel. The use of water to fight even a small mine fire is generally a dangerous proceeding, as the heat turns the water to steam which blinds, scalds and otherwise hampers the fire fighters. It is also sure to cause falls of roof. Sealing a mine is the last resort as it is expensive and slow in producing results. Many coal companies find it advisable to have on hand a chemical engine for extinguishing mine fires by the use of carbon dioxide, the most efficient fire extinguisher now known. Bi-carbonate of soda dissolves easily in water, sulphuric acid added to this bi-carbonate solution generates dioxide rapidly. Such an engine may be constructed by placing two alternating 80 gal. capacity steel tanks on a mine truck. One discharge hose, 200 to 300 ft. long, gives a steady service. When one tank is empty close the discharge valve, and use the other tank, immediately recharging the empty tank. The water carries the soda to the fire where the heat liberates the gas, which, together with the large amount of free gas accompanying the steam passing from the engine, soon makes its presence felt on the fire. Keep the nozzle of the hose as near the fire as possible. Very little water is used, therefore, but little steam is generated. The heavier than air carbon dioxide remains on the surface of the fire cutting off its supply of oxygen and smothering it.



THE COMPASS THAT WILL POINT THE WAVE-TOSSED SHIP THE RIGHT DIRECTION

The Labor Situation

SYNOPSIS—The progress toward settlement in Ohio is the main subject of interest. In the Southwest the miners have struck against the wishes and orders of the Union. They refuse to work until a new scale is made. More mines are starting in Colorado. The shortage of men caused by the war, is not so severe as was expected.

Labor troubles in Ohio are on a fair way to settlement except in eastern Ohio, where there is still a wide gap between operators and miners. During the past week, the parties in contention in the Crooksville district settled their working conditions, and arrangements were made to resume mining Aug. 10. This district produces a large amount of coal.

The conference of operators and miners in the Pomeroy district continued during the greater part of the week, with the result that practically half the district resumed work Aug. 10. The bone of contention in those mines in the section which is still idle is a differential of 4c. on the pay for "brushing." Miners are insisting on this differential, while the operators are loath to pay it.

MASSILLON SPLITS

In the Massillon district, a split occurred in the ranks of the operators. The Peacock Coal Co., which is one of the larger operators in that district, signed up with the miners at 47c. for machine-mined coal, and work was resumed. Other operators have not yet signed up. The meeting of miners and operators at Massillon broke up Aug. 6, no day being appointed for further discussion. The miners are willing to let any operator work who will pay 71.19c. per ton for pick-mined run-of-mine coal.

In the Hocking Valley and Jackson fields, preparations are being made to put all the mines in operation. Many started last week, and the work of getting others in shape for working has been rushed. The same conditions prevail in the Cambridge district.

THE BITTER DIFFERENCES IN EASTERN OHIO

In the eastern Ohio district, a conference of operators and miners held at Wheeling, W. Va., produced no tangible results. This was a meeting of subdistrict No. 5. President C. J. Albasin renewed the demands for a rate of 47c., which was promptly refused by the operators, led by T. K. Maher, of Cleveland. President John Moore, of the Ohio miners' organization, then invited the operators to sign up individually with their miners at the 47c. scale, and this was followed by C. E. Maurer, of the Glenns Run Coal Co., inviting the miners to sign up at the last year's figures. He was hooted and threatened by the miners.

The miners, it was believed, were prepared to make concessions. It was thought that they would not have called a meeting if they had not been so disposed. But it was soon found that neither side was prepared to give way. The matter was not even submitted to a scale committee, but was discussed before all the operators and delegates. It is said that the representatives of the former numbered nearly 200, and that 300 miners' delegates were present.

The operators and miners both feel confident that the unanimity in the ranks of their opponents is only apparent The operators think several miners will go back to work for 41c., and several of the union men expect many operators to open their mines and offer their men 47c. Why there is this feeling of confidence in the lack of coherence of the opposing sides is hard to determine.

The miners are desperate. Since the strike on Apr. 1, they have received the large sum of $160,000 from various sources, but as there are 16,000 of them, that is only $10 per head, or about 8c. per day. Now their credit is gone and their sympathizers are tired of giving, they have nothing to live on and the feeling toward them has been extremely bitter, for many of the less worthy of them have not hesitated to take anything which was eatable, even livestock.

The Bergholz district in Columbiana County is expected to resume work as soon as eastern Ohio operators arrange with their men. It is said that the Fort Pitt mine is to be closed down for a year. The fires are being drawn from the boilers. The machinery in the mine will be removed and the workings will be allowed to fill with water and gas. It is said that the company fears that coal shipped to Canada will be declared contraband and that consequently coal in Ohio will be limited in sale.

Many of the foreign miners are looking hopefully to the European war to give them employment, and some have been forwarded transportation money to take them to New York City. But this only serves as a solution for those who are citizens of the fighting nations. It seems as if the rest must starve or give in. Albasin, who accepts neither as an alternative, is about to make a trip to the anthracite region on behalf of his men. A sum of $25,000 was distributed on Aug. 4, each man receiving about $1.50. Prior to that, there had not been a distribution of funds for some time.

A UNION MAN'S ACCOUNT OF THE ARKANSAS TROUBLE

There are no developments in Arkansas, but we have a letter from a union sympathizer, as just a man as you would want to meet, though he evidently regards a nonunion man as a criminal. He gives us some details of the violence. He assures us that as far as he knows the cause of the trouble was Franklin Bache's determination to run his mines nonunion. He "ordered his men to square up their places and take their tools off the premises last March. The contract between the men and the company did not expire until July 31, 1914." He does not state whether the union men had or had not kept their contract. On the degree of their fracture of contract requirements, Bache's action must receive or evade condemnation.

On Apr. 1 our informant says "the mine was opened with scab labor; the union miners captured the mine and ran the scabs away. The mine was opened again under guard, and they started to hoist coal July 15. On July 17, the union miners captured the mine again and destroyed everything in sight, including No. 1 Mammoth Vein, No. 3 Mammoth and Coronado No. 1.

"No. 4 is a shaft opening, 250 ft. deep; the coal is 7½ ft. thick; the output is 800 tons daily. No. 3 is a slope opening connected with No. 4. The two mines Nos. 3 and 4 were those being operated with scab labor. No. 1 Mammoth Vein is a slope opening 4000 ft. deep (?); the coal is 7½ ft. thick and dips about 8 deg. The output of the mine is 800 tons daily. No. 1 of the Coronado Coal Co. is a shaft opening, 200 ft. deep. The coal is 7½ ft. thick and the output 600 tons daily. The tipples were all of wood, but far better than those published on page 176 of this volume of 'Coal Age.'

NEED OF TROOP DEFENSE

"The amount of coal shipped during the time the mines were operated 'open shop' was 162 tons and the aggregate cost was about $3000 per ton. Feeling still runs high here against nonunion men, and it would not surprise me to hear of the Johnson County nonunion mines having a similar experience. This is a strong union country and I do not believe that a mine can be operated 'open shop' without a standing army to guard it. The Penn Mining Co. and the Sterling Anthracite Coal Mining Co., located at Clarksville, Johnson County, Ark., are the only mines in the state operated 'open shop.' They employ about 400 men at the two mines.

IS BACHE TO BLAME?

"My opinion is that Bache brought all this trouble on himself, by refusing to treat with his employees and summarily discharging all of them and ordering them off the premises. I believe their differences could have been settled if an attempt had been made to do so."

We quote this letter without comment, much as we regret the point of view. It reminds us of the remark facetiously placed in the mouth of a street-car magnate, who, seeing a poor fellow ground to pieces by the cars, said: "Serves him right; why was he walking?" Similarly in the view of our correspondent, "Serves Bache right; why didn't he employ United Mine Workers and thus prevent his property from arson and defend his men from rifle bullets?"

The court has reopened the case charging contempt of court against P. R. Stewart and others in connection with the attacks of the miners and their leaders on the mines of the Bache-Denman interests.

THE STRIKE IN THE SOUTHWEST

Throughout the Southwest, a strike has taken place. Only 10 mines in Kansas remain at work. The old contract expired July 31, and the men refuse to work till another takes its place, despite the efforts of the union to make its settlement without a suspension. Some weeks ago, the operators and union officials signed the interstate contract, but the district agreements have not yet been signed.

It appears that each mine will make its own settlement in Arkansas, Oklahoma and Texas, but in Kansas and Missouri, the contracts will be general and not individual.

THE ANTHRACITE CONCILIATION BOARD

In the anthracite region, the legal value of the decisions of the Anthracite Conciliation Board is in question. It seems very clear to the average bystander that men who contract without stipulated wage would get what the board provided, but that it would be possible to contract legally for more or less than the rate determined by the board.

A case before a justice of the peace of Audenried, on Aug. 4, is claimed by miners' leaders to be a test of the legality of the findings of the Anthracite Conciliation Board and of the agreements which have since been entered into by the men and companies of the anthracite region.

Two laborers of the Yorktown No. 2 colliery brought suit against the miners employing them for the difference between $2.26 a day, which they have been paid, and $2.84 per day, which they claim is the rate fixed by the commission and subsequent agreements entered into by the companies and the men.

The justice gave judgment in favor of the plaintiffs. The defendants filed an appeal. The case is of interest to all persons employed about the mines. The court will take testimony during the October term.

WEST VIRGINIA'S INTERNAL TROUBLES

In West Virginia, it is reported that a strong movement designed to displace Thomas Cairns, president of the United Mine Workers of District No. 17, and his assistants has been discovered, and that it has failed. The insurgents charged that Cairns and others did not abide by the instructions from the district convention in their dealings with the Kanawha Coal Operators' Association, and that in other ways they did not act in good faith. It is understood, however, that a convention called to take steps against the union leaders in response to their charges was not held because of a lack of sympathy with the movement on the part of the men.

MORE COLORADO MINES OPERATE

In Colorado, the Rockland mine of the Walsenburg Coal & Mining Co., employing 75 men, resumed operations on July 31 and will operate on the open-shop basis. The mine has been closed since the strike was called. The Gordon mine has started operation under a contract with the United Mine Workers of America. Both mines are graciously permitted to work under an order of the War Department, a decision having been made by the Secretary of War.

Peter Caizoulas, a leader of the Greeks, who replaced the bootblack padrone, Louis Tikas, at the Ludlow tent colony, has been arrested, charged with murder in connection with the death of nine employees of the Rocky Mountain Fuel Co. at Forbes on Apr. 28.

THE SCARCITY OF LABOR

There will probably not be a great reduction in the labor forces of the country due to the European war. The people most anxious to take part are the Serbs, Austrians and Germans. It is hard for either of these to find their way into Europe at this time, and this condition has discouraged enlistment. Most of the other foreign workmen are only too glad to be free of the necessity, and, as for the subjects of Great Britain, they could not be compelled to serve even if at home, and are little disposed to show their patriotism by active service.

The most menacing feature in the situation is the possibility that Canada, wishing to save money, for she pays larger wages to her soldiers than any other people, and anxious to spare the lives of her citizens of British birth, may establish a foreign legion and give the Serbs, Greeks, Bulgarians and a few French and Belgians a chance to serve. This has been proposed, but it seems unlikely, and even then it could not seriously affect the labor market.

In fact, with the slackness now universal, we would lose but little, and many of those lost would be those who could go without our grieving. Ludlow, for instance, might be depopulated of its trouble makers. The only fear is for the time when the return takes place. Then the work of Americanization must commence all over again, and if we have a strike at that time, these warriors may establish themselves in new tent colonies and harass those who are willing to work.

FOUR-DAY WEEK

The Scottish Miners' Union has decided that after July 27 all members must work only four days a week. The production of coal is being limited so that all will have work. The employers desire to lower wages from $1.75 to $1.46 per day; they even threaten a lockout in which 100,000 men will be involved. The wages in Scotland are not as good as those in Wales, owing to the inferior quality of the coal and the difficulties in mining.

Efficiency Contest

Officials and employees of the Lehigh Valley Coal Co., to the number of more than 700, attended the annual employees' outing at Hazle Park on Aug. 8. In the morning there was a business session. The men are organized as a social and beneficial society. The following officers were reëlected: President, Supt. G. T. Gallagher, West Pittston; vice-presidents, A. M. Allen, Hazleton, and Patrick Loughlin, Centralia; secretary, Edward McKernon, Hazleton; treasurer, W. S. Freegans, Kingston.

The rock-drilling and timber-splicing contests, the 100-yd. dash, a boat race and shotput made the most interesting part of the day's events.

The rock-drilling contest was won by the team from the Lehigh Division, August VanBlargun and John Krynak. The second team in the race was John Ryan and Edward McShea.

The timber-splicing contest was won by the team from the Mahanoy and Shamokin Division. The members of the team were William Hovenstein and Elmer Daniels. Their time was 11 min. 55 sec. The Lehigh Division team was second. The members of the team were Henry Foose and Solomon Wetzell. Their time was 12 min. 42 sec.

The surveying contest was one of the new features of the day. Various surveying corps, representing the separate divisions, worked out a given surveying problem. Time and accuracy were considered in the judging, accuracy being placed first and speed second. The corps representing the Lehigh Division was first. The members of it were Edward Bachman, William Rohrbach, H. A. Kilde and Fred Holderman. The corps' average was 93 per cent.

Edward Tudgy, of Warrior Run, Wyoming Division, won the 100-yd. dash. Edward Reese, of the Lackawanna Division, won the shotput. He threw the shot 29 ft. 4½ in. Thomas Farrell, also of the Lackawanna Division, was second.

The boat race, twice around Hazle Park in a rowboat, was won by the Lackawanna Division, with Aleck Bryden as oarsman and Frank Smith as his passenger. Edward Stevens was second.

John A. Redington, proprietor of Hotel Redington, of Wilkes-Barre, served lunch at noon. A troop of boy scouts who were on the ground were also taken in for lunch.

Splitting an Air Current

Splits should start as close to the downcast shaft and terminate as close to the upcast shaft as possible. The advantages of splitting an air current are as follows:

(1) Each district is supplied with its own air current, traveling at a reduced velocity, thus meeting with little resistance. (2) Purer, fresher air, less polluted by gases. (3) Larger volume of air with the same power on the air. (4) Each split a complete and independent ventilating system. A fire in one split cannot be carried by the ventilating current into another split. When the velocity of the air is insufficient to remove gas found in the radius of its influence or when the combined resistance of the splits exceeds that of the shafts, then splitting has been carried too far and the end sought has been defeated. Splitting should be uniform. The amount of air passing into the various sized splits should be in proper proportion or the short districts will absorb more than their share, as the quantity of air taken up by each split depends on the length and sectional area of the split.

Who's Who in Coal Mining

Frank D. Rash

Over in Kentucky is a real live Mine Owners' and Operators' Association, which breathes the breath of health and progress. It owes its rapid and successful growth chiefly to its humanitarian principles.

Safety first, forebearance, power to the weak, coöperation with the strong and partiality to none are among the ingredients of the tonic which has braced the legs of this young organization for the good race. And its broad-minded policies have, mind you, marked it as a body amply fitted to keep pace with the output of the Kentucky mines, which, by the way, have pulled on their seven-leagued boots and turned tail upon their past performances.

FRANK D. RASH

At its annual meeting, not long since, the association cast a lingering eye over its membership with the intention of selecting a president for the coming year. The lightning of fate struck upon the unsuspecting head of Frank D. Rash, and approval echoed from the entire industry of the whole state.

Mr. Rash hails from one of the older coal fields of America, that of western Kentucky, and here it was that he gained his sympathetic training in the school of the square deal. Forbearing patience, advice that encourages, appreciation of service are some of the traits which have won for him a warm place in the hearts of his men.

Graduating from the Massachusetts Institute of Technology in 1901, Mr. Rash entered the engineering department of the St. Bernard Mining Co., at Earlington. Concentration and industry soon established him as chief engineer, from which position he became general manager. He now bears the title of vice-president and general manager.

As an expert on industrial legislation, he last spring took an active part in coöperating with the committee framing the new Industrial Compensation Act and the Kentucky Mining Laws as they now stand. These measures were adopted by the Kentucky Legislature.

Mr. Rash is also the first vice-president of the Kentucky Manufacturers' and Shippers' Association, and just recently relinquished the honor of being the second president of the Kentucky Mining Institute. He is also a member of the American Institute of Mining Engineers, the Engineering Association of the South and a charter member of American Mine Safety Association.

Among the most notable of Mr. Rash's contributions to the scientific press are his articles on "Forestry as Related to Mining" and "What Is Necessary to the Proper Development of the Kentucky Coal Fields."

Prize Gardens in West Virginia

With the award of prizes, for the beautifying of their homes, to the miners of the Gulf Smokeless operations, at Tams, W. Va., that company enters a movement which is rapidly spreading through the New River, Winding Gulf and Pocahontas coal fields of West Virginia.

Some time ago W. P. Tams, the general manager of the above company, announced that an inspection would be made on July 1 of the houses and yards of those miners who wished to enter the contest. The prizes were to be $15 for the best garden in that section of the town where the white miners live, $12 for the next best, $10 for the third and $8 for the fourth. For general appearance of premises there was an award of $15 for first prize, $12 for the second and $10 for the third. The same prizes were offered for the best gardens in the colored section.

On July 1 a committee of three men and two women from the town of Beckley, none of them being in any way connected with the coal business, made a thorough inspection of the premises of the contestants. It might be said, in passing, that nearly every householder in the town was a contestant.

The committee had no easy task to make the awards. Every house was clean and neat and a source of pride to the housewife and of congratulations on the part of the committee.

White Section—Best Garden

J. K. Fisher, first prize	$15.00
J. A. Mawhinney, second prize	12.00
H. T. Roberts, third prize	10.00
Premo Platti, fourth prize	8.00

For General Neatness and Appearance of Premises

W. M. Spencer, first prize	$15.00
J. K. Fisher, second prize	12.00
J. E. Sowers, third prize	10.00

Colored Section—Best Garden

Harry Franklin, first prize	$15.00
Ellis Eubanks, second prize	12.00
J. C. Burke, third prize	10.00
Daniel Ford, fourth prize	8.00

For General Neatness and Appearance of Premises

Harry Franklin, first prize	$15.00
J. J. Steel, second prize	12.00
Harry Alderson, third prize	10.00

In order to encourage the miners to enter the contest and beautify their homes and to put everybody on an equal footing, the operators furnish all the fertilizer necessary and do whatever hauling is needed. Other operating companies are making similar offers of prizes under similar conditions and many of the mining camps in the three fields are in better condition than they have ever been before.

Editorials

A Self-Sustaining Country

The dreadful events of the past few days in the European war are most depressing; however, the one fact we should not lose sight of is that we are at peace with the whole world, and we are able to supply ourselves and others with the needs of mankind. No matter what the outcome in Europe may be, the United States will continue to raise wheat, corn and cotton; we will have plenty of beef and pork and our mines will still produce iron, coal, gold and copper. Nothing could be more appalling than the calamity that has befallen the peoples of Europe, but Americans can go ahead and live and work even if the conflict abroad should last for years, which, by the way, is unlikely.

England became great largely through its isolation in a former European war; there is no reason why America should not emerge from the present world disaster with the advantage entirely on her side.

The Verner Theory

The Verner theory about the counter air current in a mine explosion has gradually gained strength, though it still has silent though powerful opponents. We have steadily published Mr. Verner's conclusions because we believed there was some evidence that they might be right even though perfect confidence in them was not possible.

Perhaps we did not feel any more certain of them when John Harger approved them, for Mr. Harger is a little disposed to be attracted by novelty for its own sake. We like him the better for that, though we are a little chary to follow his bold leads.

However, now John Verner has found at the Eskmeals station and in Samuel Dean most valiant defenders who saw visible evidences that his statements were true. We hardly believe that the procession and recession of the board in the mouth of the galley was vibratory. It seems almost certain that it had its origin in a counter draft.

We shall be pleased to hear what his opponents advance as the cause for the movements of the board. The article by Samuel Dean, "A Visit to the British Experimental Station at Eskmeals," will well repay reading, especially the short notes on the points of greatest danger in a coal mine, that is, the places where an explosion of dust may be most easily started.

Miners' Work and Wages

A study of the coal-company payrolls of today discloses interesting, not to say amazing, facts regarding the compensation of the rank and file of the mining industry. In looking over some statistical data of this nature, compiled from the records of one of the leading "hard coalers," we found some 300 men whose wages exceeded $65 for a two-week period. A large proportion of these men crossed the $100 mark, quite a number earned around $150, while one miner received the remarkable total of $190 for the two weeks' labor. These figures are net, after all deductions. They also cover a recent period with the coal markets at the low point of the year and operations consequently restricted to the minimum.

Further inquiry and analysis of the conditions under which the highest wages were earned failed to develop any satisfactory explanations. Skillful mining ability, supplemented by a moderate ingenuity and a consistent adherence to the work day by day, were the only discernible requisites. Nor does the work of these wage leaders involve the strained and continuously sustained endeavor that might be expected as the natural accompaniment of a high rate of compensation for the laborer in any walk of life. On the contrary, these men, as a rule, wind up their day at one or two o'clock in the afternoon except during slack periods, when they make up the deficiency by driving extra yardage until four o'clock.

And yet these same men are utilizing their funds, in many instances, educating their sons to become bank clerks. Inherited foremanships in the anthracite collieries have ceased to exist, as is evidenced by the fact that the company officials have been forced to the modern expedient of local mining institutes to shape up likely material for such positions. Assuredly the mining industry is rapidly losing caste.

Agricultural pursuits have in modern times been similarly forsaken for the veiled glamor of city life. But more recently, the tide has turned, and thoughtful men are awakening to a realization of the basic importance of the products of the soil in the world's commerce. How soon and by what means are we going to create a like reversal of sentiment towards the coal industry?

Turning to the purely economic aspects of the case, this relatively high remuneration makes a startling comparison with that of other classes of wage earners. The mining, or digging of coal, at its highest development scarcely falls within the scope of "skilled labor," as does that of plumbers, electricians, locomotive engineers, etc. In any event, the highly trained man in these lines would certainly resent the comparison even though it be evident that his opportunities for material gain are substantially less.

As compared with the prevailing rates of compensation for professional and scientific men, the results are even more striking. In spite of James J. Hill's pertinent apothegm: "It is not the high cost of living, but the cost of high living," it is becoming increasingly difficult for the average professional man, dependent entirely upon his salary, to maintain the appearance demanded by his position. Indeed, there is a glaring incongruity apparent here as regards the engineering profession. The engineer forms the buffer between capital and labor, the former crowding him for fatter dividends, while the latter brands him as a tentacle of the money octopus, and, in the recent increases in the cost of living, he has been too frequently overlooked.

The Bent Statement in Illinois

As related in last week's issue, Edward T. Bent, a member of the Executive Board of the First District in the Illinois Coal Operators' Association, and general manager of the Oglesby Coal Co., declared before the federal Industrial Relations Commission that the reason why working conditions in Illinois were better than in Colorado or Michigan were "because they (the union) licked us in 1896."

We do not know what made Mr. Bent and F. S. Peabody make such remarks as have recently been recorded. It may possibly be that they are seeking, as are almost all of the operators in union districts, to advance the cause of unionism in nonunion states. They feel they cannot do better than assure the public that the medicine they are taking is sweet and not bitter to the taste, so that the people, believing in its healthful qualities, will be disposed to subject the coal operators of Colorado and Michigan to a dose of it by forcible feeding. That is why they assure us that this involuntary nutrition is a joyous operation. We have known no patients who, in privacy, ever declared that they liked it. Some say, it is true, if the union were different, it would be a blessing, but no one says he enjoys it as it is.

Whatever the real opinions of Messrs. Bent and Peabody may be, and why may not some men see red and think it green? we are disposed to question the truth of their remark that the operators were licked in 1896. They were then barely making profits; they are in a perilously similar position today. Hence the increased wages of the miners did not come from profits, but from a raise in prices. In short, not Bent and Peabody, but the ultimate consumer retired discomfited in 1896.

Bent and Peabody may have carried the sword and worn the epaulettes, and they and their followers may have thought they were defeated, but the rank and file who buy coal and use materials manufactured with the aid of coal, the noncombatants, in short, were the people who were routed and have remained in that condition ever since. You cannot separate an army's interest from that of the nation which it is defending, and you cannot raise wages against the operator without injuring the consumer, unless the mine owner is really and truly robbing the public, and even then it is probable that he can go on doing it thereafter.

But perhaps it will be contended that the miners neither stole a march on the operator nor the consumer, and battled only for the right. The consumer, perhaps, had a right to suffer a defeat in 1896, for coal mining might not have been paid as much as such work merits. It is probably true that mining is not a pleasant trade; at least it is not so regarded, though miners once in it will not leave. It is true that it is considered unhealthful and dangerous, though it is probably unusually healthy and not as dangerous as generally supposed.

However, of all unskilled or partially skilled trades, it is the best paid. The rate of wage for men drawn from the working face at the will of the mine foreman is 60 per cent. higher than ordinary working wages of unskilled men on the surface. Outside daymen get at least 20 per cent. larger wages than ordinary transient day labor and have steadier jobs. There is reason to believe that organization has raised the mining wage above the average wages of workingmen of equal skill, and the ultimate consumer has been compelled to pay this larger wage.

If the mines become strongly unionized from the state of Washington to that of Pennsylvania, that price will be still further increased. We confess we have a great deal of sympathy for the deserving yet unclassified workingmen who, unlike the mine workers, are not allied with any extensive interest which can defend them.

These tradeless men, like the men in early England who were labeled "masterless" and were attached to none of the powerful guilds, are fit subjects for our pity in the midst of a number of powerful unions, numbered among which we must remember are those of doctors and the lawyers with a scale for every type of service.

Varieties of Unionism

As there is but one body of union men in the coal industry, the United Mine Workers of America, it is natural to think that there is a general character of unionism pervading the mining districts from end to end. But as a matter of fact, the difference is immense. In those districts where the union is established, men are desired by the executive who will quietly sit down on the lid and prevent discord. In such sections of the country the energy of unionism is all in the pit committees. The higher officials realize that from their men must come the special and regular assessments by which the treasury of the national organization is filled and by which attacks are made on the nonunion districts. That is why pacific men, almost statesman-like in their qualities, are favored in the pacific districts, and unquiet souls, with fiery ardor and a desire for a "scrap," are sought out for Colorado, West Virginia and like states as soon as any part is marked out to be unionized.

It is for this reason that operators like E. T. Bent prefer to deal with the men in authority rather than with the pit committee. Higher officials in the union realize that peace is forced on them if they ever hope to have the sinews of war. They know that a national strike in the industry can but mean a complete overthrow for the union, and understand well how a fund of $160,000 melts into $10 bills when 16,000 men have to draw on it, as in Ohio. This knowledge made John T. White an uncompromising foe to a strike in the central competitive districts and causes him to urge the men to keep at work in the Southwest at present.

But the pit committees and delegates see only their own immediate needs and would wreck the union to obtain their own ends. At Indianapolis, the latter declared that the leading officials were lacking in sympathy with the man at the face, and got a scale committee, as they thought, more in sympathy with their aims; only to find these men fail them as soon as the bare facts were presented. The new men proved as conservative as those they replaced.

Your chairman of the pit committee, glorying in his new-found dignity, dividing the resources of the union by the number of the men engaged in his little mine, argues for an immediate assault on the enemy. After a few weeks' travel about the country, he begins to see that the United States is very big and many men are mining coal and is told the union funds amount to little per capita. His friends hardly know him when he returns. He has the views of a capitalist and an economist.

Legal Department

Coal as Contraband of War

By A. L. H. Street*

SYNOPSIS—Coal is held by the law of nations to be contraband, and hence subject to seizure and condemnation, only when destined for military or naval, and not civil, use.

The prospect of continued war in Europe suggests several important questions of international law which have peculiar application to export shipments of coal and other fuel. As was said by Wharton, the eminent authority on the law of nations, long before the present war was foreseen, "the only points as to which we would be likely to come into collision with a European state are those concerned in the maintenance of neutral rights."

It is a well recognied principle of international law that citizens of a neutral nation may, within the bounds of their own country, sell to belligerents whatever belligerents choose to buy, subject to the exception that a neutral must not discriminate by selling to one belligerent and refusing to sell to another. (Moore's Int. Law Dig.)

Contraband goods destined to an enemy's port being subject to seizure and condemnation by a belligerent, although carried by a neutral, the question arises: Is coal contraband? Broadly defined, "contraband goods" are those which may directly aid belligerent operations, but accurate classification of contraband or not is impracticable, according to the decision of the United States Supreme Court in case of The Peterhoff, 5 Wall. 28, 58.

"But," says the court, "that which is best supported by American and English decisions may be said to divide all merchandise into three classes. Of these classes, the first consists of articles manufactured and primarily and ordinarily used for military purposes in time of war; the second, of articles which may be and are used in time of war or peace, according to the circumstances, and the third, of articles exclusively used for peaceful purposes. Merchandise of the first class destined to a belligerent country or places occupied by the army or navy of a belligerent is always contraband; merchandise of the second class is contraband only when actually destined to the military or naval use of a belligerent, while merchandise of the third class is not contraband at all, though liable to seizure for violation of blockade."

By both reason and authority, coal belongs to the second class; that is, it is contraband "when destined for a naval station, a port of call, or a ship or ships of the enemy." (Moore's Int. Law Dig.) In the case of Balfour, Guthrie & Co. vs. Portland & Asiatic S. S. Co., 167 Federal Reporter, 1010, the United States District Court for the District of Oregon cited a decision on the point that commodities of the second class, if destined to a commercial port, will be presumed to be going there for civil use; but not if they are going to a port of military equipment, and especially if there be a hostile armament then preparing there. Coal, if from the nature of the locality in the enemy's territory to which it was destined, might be considered to be intended for the use of the enemy's army or navy, was declared to be contraband under an order issued by Japan during that nation's war with Russia. And a retaliatory order of Russia declared that all fuel should be deemed to be contraband.

The following statement from the Oregon case above cited would seem to be applicable to coal as well as to provisions:

"Perhaps a mere declaration by a belligerent nation that articles of commerce are contraband, when by the rules of international law they are not, would not make them so. But here is a proclamation touching provisions that rest upon the border line, and depend for their real character upon the particular state of the port of their destination, whether engaged in civil pursuits only, or in equipping the army or the navy with war supplies. It would seem that, under such conditions, the proclamation of one of the governments at war would be effective to impress the provisions with the character of contraband."

*Attorney-at-law, St. Paul, Minn.

Recent Judicial Decisions

When Is Mine Owner Liable for Improvements by Lessee?—Where a lessee contracts with outsiders for unwatering of a mine, the owner is not liable for work done or materials furnished under the contract, unless he knew or had reason to know that the persons doing the work and furnishing the materials were relying upon him for pay. (Colorado Supreme Court, Reynolds vs. Norman, 141 "Pacific Reporter, 466.)

Shipper Chargeable with Notice Concerning Freight Rates—When a railroad company has published its freight rates on shipments between points in different states, a shipper is presumed to know what the true rate is in a particular instance, and cannot recover damages from the company for misquoting the rate. (United States District Court, Eastern District of Arkansas; J. H. Hamlen & Sons Co. vs. Illinois Central R.R. Co.; 212 Federal Reporter 324.)

When Offer Is Accepted—Where an offer to buy or sell is submitted by letter, an acceptance is conclusive and binding when a letter is deposited in the post office accepting the same. The delivery to the one making the offer is not the test; for when the offer is submitted in that way it is equivalent to an invitation to accept by the same means, and when the acceptance is delivered to the agency chosen by the one making the offer the contract is complete. And so, where the offer is by telegram, and the answer is by the same means, the contract is then complete. The risk of prompt delivery is upon the one selecting the agency. (Texas Court of Civil Appeals, Kenedy Mercantile Co. vs. Western Union Telegraph Co., 167 "Southwestern Reporter," 1904.)

Responsibility for Injury to Employee While Riding on Train—A mine repairman who was injured in a collision between trains operated by his employer, while riding with his legs hanging over the front end of a car, in violation of the employer's rules and of the Pennsylvania Anthracite Coal Act, cannot recover damages on account of the injury. Nor is the employer liable if the collision resulted from movement of the trains without authority from the foreman in charge thereof. It is further held that the mere happening of an accident, from which negligence of the employer might be inferred, does not establish liability on his part; an employee suing for injuries received must prove the specific act of negligence relied upon. (Pennsylvania Supreme Court, Dugan vs. Susquehanna Coal Co., 88 "Atlantic Reporter," 787.)

Somerset County, Penn., First-Aid Meet

The second annual Somerset County Miners' First Aid Meet was held on July 22 at Somerset, Penn., under the direction of the State Young Men's Christian Association, George B. Landis, of Harrisburg and A. W. Harris, of the Bureau of Mines being in charge. The use of oxygen helmets in rescuing miners from explosions was demonstrated in a brattice-cloth mine heading constructed for the purpose. In the three-man event, six teams tied on the first problem. Of these four remained after the second and on the third trial the Meyersdale team won. Messrs. Elmer Barnhart, David R. Spence and Clay Beynon demonstrating.

As is natural the greatest interest was shown in the team competition. The problems given were:

Shot-firer caught by flying coal, right eye injured, right collarbone broken, cut on right forearm. Improvise stretcher and carry.

Powder keg exploded, burning miner severely on face, neck, chest, back and both arms. Carry 50 ft. with improvised stretcher.

Man has a broken back from fall of roof. Improvise stretcher and treat.

In the average for these events the teams stand as follows:

1.	Somerset Smokeless, Boswell No 2	100
2.	Jenner-Quemahoning, Jerome No. 1	99⅝
3.	Consolidation Coal Co., Acosta No. 1	99⅛
4.	Jenner-Quemahoning, Jerome No. 2	98⅝
5.	Somerset Smokeless, Boswell No. 1	98½
6.	Consolidation Coal Co, Acosta No. 2	98⅛
7.	Consolidation Coal Co., Meyersdale No. 1	97⅝
7.	Consolidation Coal Co., Meyersdale No. 2	97⅝
8.	Quemahoning Coal Co., Ralphton	94⅝

Prizes were won as follows: One-man event, Ralphton team of Quemahoning Coal Co.; two- and three-man events, Meyersdale team No. 1 of the Consolidation Coal Co.; team event, first prize to Orenda No. 2 team of Somerset Smokeless Coal Co., of Boswell; second prize to Jerome No. 2 team of Jenner Quemahoning Coal Co. The first prize for the team contest was a silver cup, presented by the E. I. duPont de Nemours Powder Co., and the second prize was six sets of Seddon's Self-Help series of mining lessons. The American Red Cross secretary awarded certificates to the winners of the other events. The Y. M. C. A. presented bronze buttons to all of the contestants. The American Mine Safety Association awarded medals to the winning team. The judges, all of whom were doctors approved by the American Red Cross, were Dr. Edward Pardee, South Fork; Dr. S. J. H. Louther, Somerset; Dr. J. W. Hawes, Windber; Dr. Henry Hertzler, Jenners, and Dr. George F. Speicher, Rockwood.

Western Fuel Co.'s Rescue Corps

By J. W. Jemson*

The Western Fuel Co. is the holder of the silver cup and championship of Vancouver Island, Canada, for the years 1912 and 1913. The photographs show the personnel of the St. Johns Ambulance and mine-rescue teams for 1914. Three teams will represent the company at the St. John's Ambulance Demonstration to be held in Vancouver, Aug. 17, on which occasion the Duke and Duchess of Connaught will be present. The Duke, who is Governor-General of Canada, is an enthusiastic adherent of the Ambulance association and on his previous visit to Nanaimo, two years ago, commented most highly on an improvised stretcher made by the Western Fuel Co.'s men with articles found in the mines, consisting of three coats and long-handled shovels, such as are used for removing undercuttings after machines.

*Box 478, Nanaimo, B. C., Canada.

Bringing the Man and the Job Together

There are a number of coal companies in this country in need of men with special training to fill positions in and about the mines. Coal Age believes that it is the natural medium whereby competent mining men and companies needing the services of such men can be brought together. We are, therefore, encouraging coal companies to inform us of their needs so that we can put them in touch with experienced men, capable of rendering satisfactory service.

Here is part of a letter we received this morning, and which comes to us after the page in our paper containing "Want Advertisements" had been closed for this week's issue. The company in question is operating in West Virginia and writes as follows:

The returns from advertisement you inserted for mine foreman were so satisfactory that we should like to have you print a similar advertisement, to secure for us a general electrician, or master mechanic, to have general charge of the repair work and inspection of machinery of our several mine equipments, machine-driven tipples and power houses. This man should have sufficient technical information to intelligently work after A. C. and D. C. current. The man must be a hustler, as this is not an office position in any sense. He should be familiar with mine haulage and equipment.

Any Coal Age readers who are interested in the above position will please send their application to Coal Age, addressing it P, 292. When applications are accompanied by letters of recommendation, the latter should always be copies of the originals and not the original letters themselves. For reasons that are obvious, the identity of the coal companies advertising for men will not be divulged. It is also impossible for us to guarantee that all applications will be acknowledged or answered. If there were only five or six applications for any particular job, there is no doubt but that the coal company desiring a man would extend to each applicant the courtesy of an acknowledgment, but where the applications number anywhere from 50 to 200, it is unreasonable to expect that every application will receive a personal reply.

Two Mine Rescue and St. Johns Ambulance Corps of the Western Fuel Co.

Discussion By Readers

Checkweighmen

I am pleased to say that the foreword, COAL AGE, July 11, p. 51, on the subject of checkweighmen, has been read with considerable interest in this section. All of the mines in this part of Kentucky are nonunion, and 90 per cent. of them will not operate without a checkweighman.

Although the state law of Kentucky provides for a checkweighman at mines, the act is not compulsory further than compelling the operator to permit the employment of a checkweighman by the miners, upon the request of a majority of their number.

I am glad to be able to indorse the views expressed in your foreword, that coal operators are not generally opposed to the employment by the miners of a checkweighman. As there stated, in reference to the large coal companies of Alabama following the strike of 1908, our company favors the employment of a checkweighman, and insists on the men electing a person to serve in that capacity.

W. L. Moss, V.-P. and G. M.,
Continental Coal Corporation.

Pineville, Ky.

Conservation of Surface Values in the Extraction of Coal

The discussion of the effect of the mine-run law, COAL AGE, Aug. 8, p. 239, incidentally draws attention to a most important consideration, which until recently has not received the recognition it demands. I refer to the adoption of means and methods in coal mining that will afford adequate support to the surface overlying the seams of mineral extracted.

The United States has reached a stage of development when the conservation of its natural resources has become absolutely necessary if it is to continue for any length of time as a producer for domestic and foreign consumption. As a result of the conservation methods already enforced, the coal-mining industry is conducted on more scientific and economic principles, both with respect to production and safety.

While economic extraction is an important factor in conservation, the operation of this factor is detrimental, in many instances, to the conservation and preservation of the resources of an industry as important, if not more so, to the welfare of a nation's prosperity as mining. Many of our large coal fields underlie sections that are valuable for their natural wealth of soil. By our present methods of extraction, such territory is rendered worthless or its productiveness is greatly depreciated.

Conservation, applied to mining, has limitations not characteristic of other natural resources. If land, favorable to agricultural pursuits, be denuded of its vegetation, we can conserve the forests by planting new growths in sections that are not so favorable for this industry, and, by so doing, increase the fertility of the soil by supplying it with a natural fertilizer that will, in time, make it as adaptable for agriculture as the former. Coal, being a product of a prehistoric age when climatic conditions were specially adapted to its formation, cannot be conserved in this way. Its renewal is impossible, as the conditions that produced it will never again exist here. It can be conserved only by economical extraction, and I consider that a method of extraction that will preserve the surface fertility is a subject that should demand the serious consideration of mining men and the attention of our state and national governments.

Millions of money have been spent in the reclamation of desert wastes; thousands of happy homes and millions of wealth have been added to our national prosperity by this noble work—and its results are cumulative. Our nation has attained great commercial prestige and wealth by the products of its coal-mining industry, yet this industry has rendered sterile thousands of acres of land in the centers of greatest population, whose productiveness would have been of greater value to the present and future generations than are now the more distant areas of reclamation.

The conservation of land surfaces for agricultural and allied industries will, in the near future, become a question of the most important consideration to this nation. If the present methods of extracting our coal be continued, with the interritorial increase of the industry, the amount of land rendered nonproductive will assume abnormal proportions. Some method should be devised by which the coal can be extracted and the land surface retain its fertility.

I consider this matter to be of sufficient importance to merit earnest discussion.

I. C. PARFITT.

Jerome, Penn.

The Mine Foreman

Letter No. 8—The recent discussion of the qualifications of the successful mine foreman and his relation to the mine superintendent, COAL AGE, May 30, p. 898, was of great interest to all superintendents and foremen. I desire to add to what has already been said, a few words bearing on the unwise interference of a superintendent with the authority of his foreman, in the mines.

One of the vital conditions, in respect to maintaining perfect discipline in a mine, is that the foreman's authority shall be clearly recognized, not only by the miners and the assistant foremen and bosses, but likewise by his superior officers. It is the beginning of serious trouble in the mine when the owner or superintendent calls in question the authority of the mine foreman and countermands his orders, disapproving of his methods and deranging his plans. The law in Pennsylvania compels the operator to employ a competent mine foreman, and gives to the mine foreman the full charge of the inside workings of the mine and the men employed in the underground operations.

While it is the unquestioned right of the superintendent to draw the attention of his foreman to any observed violations of the law or to any mismanagement of the men in his charge; and, further, to discuss with him questions of economy and safety, in respect to the methods employed in operating a mine, this should be done privately in the office and not in the presence of the men in the mine. Moreover, the superintendent should remember that the mine foreman's experience and qualifications *should* be such as to render him a capable judge of the methods he employs; and, if he is to be held accountable for results, he should be permitted to pursue his own plans for their attainment. If these plans prove the foreman incapable, arrange a suitable division of the work or get another foreman.

Every true foreman will welcome suggestions from his superintendent, in reference to the improvement of the means and methods he employs; but too often it happens that the mine foreman does not exercise his best judgment, in matters in his jurisdiction, because of the fear of interference on the part of a superintendent who is his superior. While it may be true that a superintendent who is expert in mining methods may be able to dictate and criticize the work of his foreman, he should avoid the mistake of humiliating him in the mine, which cannot but prove mischievous. A wise superintendent, however capable, will always avoid allowing his authority to come between the mine foreman and the men employed in the mine. By so doing, he can supplement the foreman's ability with his own judgment and skill, whereas, the attempt of a superintendent to prescribe the methods of mining and control of the men, enforcing his dictation by personal oversight in the mine, will be acting in a manner subversive of mine discipline.

The attitude of the superintendent, in the mine, should be one of respect for the mine foreman's efforts and recognition of his authority in respect to the work in his charge. Anything else develops in the foreman a wise hesitancy to exercise a doubtful and disputed authority, which results at once in a lack of discipline. The same result is plainly evident in the case of foremen who are not well informed in regard to their authority and duty as prescribed, in most cases, by law or conferred upon them when they accept the office.

One of the strongest factors in mine discipline is the confidence that the men impose in the mine officials, as being qualified for the positions they hold. A lack of confidence discredits the official in the minds of his men. Such confidence can only be gained by the evident fitness of the foreman to conduct the work in his charge. For this reason, the selection of a mine foreman should be guided by the question of his fitness and merit alone. No personal, political or social influences should be allowed to control the selection of a man for this position. He must possess a personal magnetism or a *personality* that will make him an efficient disciplinarian, able to maintain his authority in the mine. Aside from this, he must possess a thorough knowledge of mining and familiarity with underground work and equipment. These characteristics in the man will lessen the danger of interference or outside control of matters that are within his natural jurisdiction.

It has been stated that many foremen and others, having passed a successful examination and having received a certificate of competency, have thought it was no longer necessary to read or study mining questions. As a fact, men who are the most capable are constant students of the conditions relating to their work. Doctor Arnold, of Rugby, when asked why he spent several hours daily in preparation of lessons he had taught for years, replied: "I wish my pupils to drink from a running stream and not a stagnant pool."

In the maintenance of discipline, more depends on the *certainty* of punishment, than on its *severity*. Experience has shown that *the uncertain enforcement of mining laws and regulations has operated largely to increase the dangers of mining.* A discarded or obsolete law often proves a menace rather than the safeguard it was intended. Discipline requires that a law enacted must be obeyed, and any violation must bring punishment, in proportion to the offense committed. Insubordination or disobedience to authority may not be tolerated with impunity.

A violation of law or mine regulations may merit the suspension or discharge of the guilty party; but, in no case, should a personal indignity be inflicted, such as styling the man a "dumb Dago" or a "dumb hunky," which appellations only give rise to resentment. Ridicule and sarcasm are not the weapons a mine foreman should use if he is to retain the respect of his men. There may be rare instances when a slight sarcasm or ridicule is necessary to take the natural conceit out of a man, but good judgment must be exercised at such times to avoid making an enemy of such a one.

LEHMAN G. HANGER, Asst. Mine Foreman,
Carbon Mine, Keystone Coal & Coke Co.
Greensburg, Penn.

Co-operation in the Mine

Letter No. 2—I read with much interest the remarks of Frank S. Davis, in reference to securing coöperation in the mine, COAL AGE, July 25, p. 155. Instituting weekly meetings of the mine foremen for the purpose of discussing and studying mine problems of safety and other matters of interest in mining, is a long step in the right direction; and Mr. Davis is to be commended for his efforts in this regard. If properly conducted and maintained, the plan will prove a fruitful means of training and educating all employees.

While I am in full accord with the idea expressed in the editorial item, COAL AGE, Apr. 18, p. 654, like Mr. Davis, I would eliminate the word "compulsory" and make the meetings optional, at least until such plan failed and it was found necessary to adopt more stringent measures in order to secure a full and regular attendance.

If more superintendents would follow the example of Mr. Davis, by instituting similar meetings, and insist upon the foremen urging the young men employed in and about the mines to attend such meetings, and endeavor to interest them in the study and discussion of the many perplexing problems pertaining to mining, the result would be the development of more efficient workmen; and a larger number of trained men would then be available and ready to assume the responsibilities of mine foremen.

During the three years that I have been connected with the examining board for the examination of candidates for mine foremanship, I have observed that those

applicants, coming from mines where officials have lent their assistance for the education of their men, have made higher grades than candidates coming from mines where no such assistance was available.

In my opinion, it would be a good investment for mine superintendents and mine foremen of large mines or groups of smaller mines, to establish schools of training for their young men. Many of the men now employed as miners possess more than ordinary intelligence and abilities of which they are scarcely aware. If these elements were properly cultivated and trained, the result would be to increase the efficiency in the operation of the mine. On the other hand, the neglect of such education and training produces a class of indifferent workers, having little ambition to rise above the plane of the common miner.

It is unfortunate that, in many cases, the mine superintendent assumes an attitude of superiority and holds himself at too great a distance from his men. In such cases, the miners come to feel that all the interest the superintendent has in them is their producing power, or the number of tons of cheap coal they can mine daily. While this is true in many instances, I am glad to say that it is not the case at all mines. Many superintendents now realize that the better trained and the better informed miners become, the better prepared they are and the more willing they seem to assist and coöperate with the officials in the operation of the mine.

The average coal miner knows little of the many perplexing problems with which superintendents and foremen have to contend daily. They are apt to think that all the boss has to do is to superintend the work and they regard him as having an "easy time." A weekly conference of the mine officials and the men, for the purpose of studying and discussing many of these problems in which they are equally concerned, could not fail to be of benefit to the operator and would unquestionably result in the greater safety and the betterment of the condition of the miners as well. The result would be that both miners and officials would be drawn closer together and would come to feel that their interests were mutual.

In closing, I cannot refrain from expressing the hope that many superintendents will adopt the methods pursued by Mr. Davis, in the informal organization of their men, for weekly conference, study and discussion. It is my belief that the time so spent would not be wasted; but that the officials in charge would be amply rewarded by the rapid increase in the efficiency of every mine worker.

JOHN ROSE,
District Mine Inspector.

Dayton, Tenn.

Study Course in Coal Mining

BY J. T. BEARD

The Coal Age Pocket Book

MEASUREMENT

The valuation and comparison of the various forms and conditions of matter and the estimation of physical phenomena are made by reference to three general standards of measurement, namely, **distance, force** and **time.** There are many modifications and combinations of these three elemental standards.

Distance—This includes the measurement of length, surface and volume, all of which are derived from the same standard of measure.

Force—All measurement of force is based on the attractive force exerted by the earth on an assumed **unit of mass** at the surface (sea level), in any given latitude. Mass thus becomes the true unit in this measurement; but being intangible, the adopted unit is the **pound,** which represents a certain definite mass, taken as the "unit of mass," for purposes of measurement. A force is measured by the effect of its action on a known mass. There are two conditions:

1. **Static** condition (mass fixed, immovable) = pressure, weight.
2. **Dynamic** condition (mass free to move) = motion, velocity.

Under these two conditions, there are, therefore, two units of force. The unit of measure for **dynamic forces** is the force that will produce a unit of velocity in a unit of mass, in a unit of time. In other words, the force that will increase the rate of motion of a unit mass, by a unit distance, in a unit time.

Time—The element of time is important in the estimation of velocity and power. For example, to traverse the same distance in one-half the time will require twice the velocity. Likewise, to perform the same work in one-half the time will require twice the power.

Special Units—There are numerous other units of limited significance; such as units of capacity, pints, quarts, gallons, barrels, etc.; units of currency, cents, dimes, dollars, etc.; circular units, degrees, radians, etc.; electrical units, amperes, volts, ohms, watts, etc.

Compound Units—Many units of measure are composed of two or more simple units. The following are examples:

Unit velocity—(distance) ÷ (time)..Ft. per sec., or ft. per min.
Unit work—(distance) × (force).....Ft.-lb.
Unit power—(distance) × (force) ÷ (time)...Ft.-lb. per min.

The above are only given as samples of many similar compound units; such as inch-pounds; miles per hour; gallons per hour; cubic feet per minute; pounds per cubic foot; tons per acre; foot-acres, etc.

All of these, it will appear, are derived from the simple units of distance, force, time, or the special units to which reference has been made.

Application—Applying these units of measure, the weight

$$F = W \qquad (1)$$

(W) of a body, expressed in pounds, is the static force (F) acting on the body, due to gravity. Hence, in statics,

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In dynamics, the force (F_1) producing motion is measured by the mass (M) of the body and the velocity (v) produced per unit of time. Hence, in dynamics,

$$F_1 = Mv \qquad (2)$$

Assuming a falling body, the force producing motion is the weight (W) of the body, and the gain in velocity per unit of time (acceleration due to gravity, **g**) is the velocity produced in the mass (M). Hence, in falling bodies,

$$W = Mg \qquad (3)$$

and

$$M = \frac{W}{g} \qquad (4)$$

which enables the calculation of the mass of a body from its weight.

Combining formulas (2) and (3),

$$\frac{F_1}{W} = \frac{v}{g} \qquad (5)$$

Hence a force acting to produce motion in a body bears the same ratio to the weight of the body, as the acceleration due to the force bears to the acceleration due to gravity. Or, expressed as a proportion,

$$F_1 : W :: v : g$$

Energy—Energy, in physics, is **capacity to perform work.** It is the vitalizing force that is manifested in matter by the familiar agencies of heat, light, electricity, magnetism, molecular attracton, chemical affinity, etc., all of which are equally convertible, one into the other, without loss.

The physical agencies or forms of energy just mentioned are each and all convertible into mechanical motion, which, again, can be reconverted into heat, light, electricity and magnetism. This fact gives rise to what is called the **"mechanical equivalent"** in reference to heat.

Forms of Energy—Energy is of two kinds that differ from each other only in the sense that one (kinetic) is actual and present, while the other (potential) is possible only.

Kinetic energy (E) is the energy possessed by a body by virtue of its motion. The force producing an acceleration (f) in a mass (M), or the "living force" in the body **(momentum),** is **Mf.** The acceleration (f) being uniform or the velocity increasing uniformly, the distance increase, per unit of time is **f/2,** and the work performed in producing this acceleration is stored in the body as "kinetic energy," by virtue of which the body would continue to move at the velocity imparted, till restrained by an opposing force. The stored energy is

Kinetic energy, $E = Mf \times \frac{f}{2} = \frac{1}{2} Mf^2$

Potential energy is the energy that is possessed by a body by virtue of the position or state in which it is held or restrained, so that motion cannot take place till the restraining force is removed. Examples of bodies having potential energy are, a suspended ball, a confined spring, etc.

Inquiries of General Interest

Permissible Electric Mine Lamps, Schedule No. 6

I want to ask why should the Bureau of Mines issue a new schedule on portable electric lamps, in which they advise and suggest certain mechanical changes to meet the ideas of the engineers in the Bureau of Mines. Many of the suggested changes have nothing whatever to do with the safety features of the lamp, and it is difficult to understand why such details of construction should be mentioned in reference to the tests that lamps must undergo, at the government station.

It is up to the Bureau of Mines to test all lamps submitted to them, to determine their *safety* and not to recommend, for use in mines any lamp that their test shows would be unsafe. It is not up to the Bureau of Mines to suggest and much less to insist on certain methods of construction, or certain requirements regarding the life of the lamp bulbs or the size and shape of the reflectors. These matters belong entirely to the various manufacturers of portable lamps, who should be free to produce their own ideas and submit the same to the Bureau of Mines for test. The Bureau, in turn, should test these lamps for safety.

When the Bureau of Mines interferes with the progress of the manufacturers of electric lamps, they place the industry in jeopardy, due to the fact that manufacturers will, at no time, be able to standardize their outfit; and operators, in turn, will hesitate about placing orders for lamps, when the type of construction may be changed at any moment. It would be a hardship for a manufacturer to be compelled frequently to change the construction of his lamps to make them conform to the whims of the bureau engineers, except as required for safety. Such changes would compel him to keep on manufacturing supply parts for all the outfits which are at present being used, and would certainly cause much confusion and annoyance for operators.

We realize that we are living in a world where one competes with another and each is endeavoring to turn out a better outfit than another. For this reason, if for no other, it is entirely up to the manufacturers of lamps to build their outfits in the best possible manner, and it is natural to suppose that the best manufactured lamps will be installed to the greatest extent.

After consulting with several coal operators who have installed electric lamps and after talking over the matter with some manufacturers of lamps, I find they are all of the same opinion and feel that the U. S. Bureau of Mines should not interfere in the manner of construction of lamps, in any respect except as regards the *safety* of the battery and the lamp.

A COAL AGE READER.

——, Penn.

Correspondent has stated his complaint in a clear and practical manner as viewed from the standpoint of both users and manufacturers of portable electric lamps. The arguments presented are logical and call for a definite statement from the Bureau of Mines, defining their purpose in the matter of testing such lamps; and explaining the requirements outlined in the new Schedule No. 6, to which exception is taken.

It is possible that the suggested changes would render the work of testing these lamps more certain and less laborious and expensive to the government. Certainly, the bureau would have no right to ask or require changes in style or construction of lamps, other than are necessary to permit of a uniform method of testing and to insure safety for use in the mine.

The readers of COAL AGE will be glad to hear from the U. S. Bureau of Mines in reference to this matter, which is recognized, at once, as being of vital importance to all users of electric mine lamps, as well as to manufacturers of the same.

Blasting in Mines Where Electricity is in Use

Having recently installed electricity in our mine, for purposes of power and lighting, I desire to ask, if the dangers due to blasting are increased thereby and, if so, in what way does the installation increase this danger?

SUPERINTENDENT.

————, Wyo.

The answer to this question will naturally be confined to the dangers due to blasting as being increased by the use of electricity for power and lighting, and does not include other dangers arising from the use of electricity in the mine, such as the ignition of gas by the short-circuiting of the current or the sparking of the wires; or the danger of shock or death to men or animals from contact with live wires, although such dangers are more common than those incident to blasting.

The principal danger from electrical blasting in coal mining is that arising from a premature blast, owing to an accidental closing of the circuit by the operation of a switch by an unauthorized person or by the short-circuiting of wires. To avoid this danger the feed wires leading to the face of the coal should not be laid, except by the miner in charge of preparing the shot and when all is in readiness for the blast, the men in adjoining places having first been notified. Where a blasting machine is used, this should be under the constant supervision of the miner who prepares and fires the shot.

The use of electricity in mines, for power purposes, may offer a temptation to the miner to tap the power current for the purpose of firing a blast in his place. There should be strict regulations in order to avoid this possibility and danger. It should also be remembered that where wires are installed in a mine, for the purpose of firing shots, the danger of lightning striking the wires and causing a premature blast should be safeguarded by disconnecting the wires at a safe distance from the working face.

Examination Questions

Questions for Examination of Mine Electricians

(*Continued from last issue*)

Ques. 13—If it should happen that the two coils were bucking each other, how would you locate the trouble in a compound motor?

Ans.—Disconnect the shunt field temporarily and test the series field with a compass, to determine the direction in which the current is circulating in the series field. Again, connect the shunt field and remove one of the brushes so as to break the current in the series field. Then, test the current in the shunt field, in the same manner, to determine the direction in which that current is circulating. The information so gained will make it possible to locate and remedy the trouble.

Ques. 14—Why is the core of an armature always laminated?

Ans.—The purpose of the laminations in the core of an armature is to prevent the generation of eddy currents, which would cause the armature to heat at those points.

Ques. 15—What is the difference, if any, between brass and bronze?

Ans.—Brass is an alloy of copper and zinc, while bronze is an alloy of copper, zinc and tin.

Ques. 16—Why are wormwheels generally made of bronze?

Ans.—The sliding motion of the worm on the teeth of the wheel produces less friction when the wormwheel is made of bronze, because bronze and steel run better together than steel and steel. Cast iron is the only metal that runs well on itself. The sliding motion of the worm on the teeth of the gear makes it more important to observe this fact in a worm-gear drive.

Ques. 17—When drilling brass, would you use the same drill as when drilling steel or iron?

Ans.—No. When drilling brass, the lip of the drill should be ground off sufficiently so that the cutting edge of the tool will be normal to the surface drilled. Otherwise, the lip of the drill will tend to dig into the brass, and the tool will be broken. With a normal cutting edge the brass is scraped, rather than cut, from the body of the metal.

Ques. 18—Would you turn a commutator with a lipped tool?

Ans.—No. A lipped tool would tend to dig into the copper and streak the surface of the commutator, which should be smooth so as to yield a uniform contact of the brushes. To prevent this, the cutting edge of the tool should be normal to the surface, so as to produce a scraping effect instead of cutting into the metal.

Ques. 19—Can brass be melted in a ladle?

Ans.—The brass will melt with difficulty unless broken into small pieces. It is better to use a crucible.

Ques. 20—What is german silver?

Ans.—German silver is an alloy of copper, zinc and nickel, the composition being quite variable, depending on the purpose for which it is intended, and the price to be paid for same.

Ques. 21—Under what condition is glass a conductor of electricity?

Ans.—Glass in the molten state becomes a conductor of electricity.

Ques. 22—In the use of carbon brushes on a generator or motor, what is a "pig-tail" and what purpose does it serve?

Ans.—A "pig-tail" is a short-wire connection between the carbon brush and the commutator ring, which makes unnecessary the passing of the current through the brush holder and avoids any difficulties that might arise from the heating of the holder.

Ques. 23—Where is the neutral point on a motor?

Ans.—The neutral point of the motor is the point where the coils that are short-circuited by the brushes are exactly midway between the pole pieces.

Ques. 24—Why are the brushes set back of the neutral point on a motor?

Ans.—The coils must be short-circuited in a field that will generate in them a current that is traveling in the same direction as the current they will receive when they leave the brush.

Ques. 25—Is it well to undercut the mica on commutators?

Ans.—Yes, if the motor runs fast enough to keep the slot free from carbon and copper dust.

Ques. 26—Is carbon a good conductor?

Ans.—Carbon is a poor conductor in comparison with the metals.

Ques. 27—What is a "feather," a feather-key or spline, and what is its purpose?

Ans.—A "feather" or feather-key is a key set into a shaft that is to carry a camwheel, pulley or other rotating part. The wheel or pulley is either forced or allowed to slide endwise over the feather, which fits snugly into the keyway, so that it is immovable. The purpose of the key is to prevent the wheel or pulley from turning on the shaft.

Ques. 28—Is a spring-lock washer left- or right-handed, or does it make any difference?

Ans.—The spring-lock washer must correspond to the nut used and is commonly right-handed, otherwise the nut could not be tightened up and the washer would be ineffectual for locking the nut.

Ques. 29—What is residual magnetism?

Ans.—The magnetism remaining in the pole after the current is shut off is called "residual magnetism." The residual magnetism plays an important part in the starting of the generator.

Ques. 35—Will a motor start light with no field current?

Ans.—Yes. The residual magnetism of the poles will enable the motor to start, under no load, with some sparking at the brushes, however.

Coal and Coke News

Washington, D. C.

Government officers are expecting that as a result of the European war, there will be a material increase in the demand for American coal of various kinds. According to officers of the Department of Commerce, the chief obstacle to the immediate development of this demand is found simply in the disturbed shipping situation. However, as soon as that condition is rendered more normal, and as soon as there is a steady supply of tonnage it is believed that a heavy export movement of coal will set in.

As a matter of fact the prevalent belief, based on advices to the government from many different sources is that at least a moderate amount of transportation will be provided within a reasonably short time. The advices received here are to the effect that the British Admiralty regard the German fleet as bottled up for the present and so long as it continues in its present situation, apparently unwilling to risk a general engagement it will be possible to keep the North Atlantic routes open while some other routes such as those to South America and elsewhere are expected to be safe from now on.

Of course, this condition would be changed abruptly, according to the opinion of public officers, should an engagement occur resulting in a serious defeat to the British ships. German vessels would then have control of the situation and presumably they would render the ocean unsafe for British and American vessels, if the latter were carrying goods of a contraband nature.

Supposing that the existing conditions are maintained, it is believed that the demand for coal will be strengthened in several distinct ways. In the first place, exports of coal from Continental countries will not be possible and those who have been depending on these supplies will naturally look to England and the United States. The disturbed conditions of production in England will be likely to throw the trade to the United States provided that oversea transportation can be furnished at a reasonable rate, as it is supposed will be the case, if a considerable amount of tonnage is restored to the ocean in the way that has been indicated.

Secondly there is every reason to believe that a good deal of shipping will be diverted from the Suez Canal route to Panama, thereby necessitating the provision of large quantities of coal on the Isthmus in order to enable passing vessels to provide themselves with fuel, it being well recognized that the possibility of coaling there cheaply is one of the essentials to the development of the Canal trade.

Thirdly, a decided increase in the amount of the trade with South American countries is looked for, in case the European war continues for some time to come, those countries being obliged to turn to the United States for many articles they have heretofore obtained in Europe. The result will be a stimulus to the amount of shipping plying between the United States and South America and a consequent increase in the amount of coal required to supply its needs.

Finally the probable demand for coal domestically consumed in carrying on industrial operations will, it is believed, be rendered greater by reason of the prevalence of hostilities abroad. A good deal of study has been given to this situation by various government bureaus and the expectations that seem to prevail are as just indicated.

A Study of the Rate Decision

Further study of the 5 per cent. rate decision of the Interstate Commerce Commission is developing some decidedly interesting data with regard to the bearing of the decision upon the coal industry and the position of the coal roads. The complete text of the decision is now available and contains considerable matter bearing directly on this subject. One point of considerable interest made by the Commission is that on the coal roads the cost of operation has been greatly reduced. The Commission says:

But even if the evidence clearly established an increase in the general freight operating expense ratio, we should not be at liberty on this record to conclude that the cost of transporting each kind of freight had increased much less than it had increased proportionately. The evidence is clear that as to certain classes of bulk or heavy freight, like coal, coke, ore, cement, brick, tile, clay and plaster, the use of larger cars must have reduced operating costs, whereas in respect to expedited package freight, shipped in cars moving on a regular schedule, regardless of the quantity of their contents, the use of larger cars, involving greater unused car capacity, must have increased the operating costs. Similarly the extension of the expedited service in carload freight must have increased the cost, while the heavier train loading of the slow train, in which the heavy or bulk freight usually moves, has tended to decrease the cost.

Eight systems in official classification territory, each of which shows for 1913 an operating ratio of less than 66⅔ per cent., are known as coal or ore carrying roads; namely, the anthracite coal carriers, the Central of New Jersey, Delaware & Hudson, Delaware, Lackawanna & Western, and the Reading, and the bituminous coal and ore carriers, the Hocking Valley, Kanawha & Michigan, Norfolk & Western and Bessemer & Lake Erie.

The tonnage of each of these roads consists in large part of the products of mines, and all of them are very prosperous. Each of the bituminous roads has an exceptionally low yield per ton mile for all traffic, and yet the representative yield per ton for carrying bituminous coal is lower, and on most of these lines much lower, than their average per ton mile revenue.

The Commission goes on to demonstrate this fact by citing figures for the traffic and returns of the bituminous coal roads showing that the percentage of the tonnage of the products of mines to the total tonnage is 79.78 per cent. in the case of the Hocking Valley R.R., 82.60 per cent. in that of the Kanawha & Michigan, 76.05 per cent. in that of the Norfolk & Western and 87.95 per cent. in that of the Bessemer & Lake Erie R.R. The representative bituminous coal net yield per ton per mile in the case of these roads is respectively 2.56 mills, 3.03, 2.88 and 4.50 mills. A comparison of the operating results of the New York Central R.R. and the Pennsylvania R. R. with the leading coal carrying subsidiary of each tends to the same general conclusion.

No Discrimination against Bowling Green

The Interstate Commerce Commission has just handed down an important decision in the case of the Bowling Green Business Men's Protective Assn. vs. the Louisville & Nashville Ry. in a case involving among other things a considerable tonnage of coal.

In this case it is held that the construction of through rates from Chicago and Milwaukee territories to Nashville, Tenn., by the addition of proportional rates from points of origin to the Ohio River to the local rates from the river to Nashville, contrasted with the construction of rates to Bowling Green by the addition of the local rates to and from the river crossings does not result in undue discrimination. The construction of through rates from Indianapolis territory to Louisville in a similar way is, however, found to constitute undue discrimination against intermediate points.

HARRISBURG, PENN.

No railroad or other carrier of coal may transport this commodity in cars owned by the producer at a lower rate than is charged for carrying the same commodity in cars not so owned. This decision was made on Aug. 7 by the Public Service Commission in disposing of a complaint that interested the entire bituminous region of the state.

The gist of the commission's decision is that to permit a lower rate to be charged when coal is carried in the producers' cars will open the way to actual discrimination in favor of certain customers because the producing company could thus sell coal to such customers for less than would be charged those who got coal on which the full freight rate was charged.

The Pennsylvania R.R. Co. is the respondent in the case, the complainants being the Pennsylvania Rubber Co., the Westmoreland Specialty Co., the Pittsburgh Lamp, Brass & Glass Co., the McKee Glass Co. and the American Window Glass Co. The complaint involved rates on coal from Penn, Biddle, Irwin, Hahnton, Jeannette and Grapeville.

New rates were put into effect by the Pennsylvania R.R. June 1, and most of them were declared to be reasonable, but it is ordered that the rate from Biddle to Grapeville be reduced from 25c. to 20c. a ton, the same as the rate to Jeannette, and that from Hahnton to Jeannette be reduced from 20c. to 25c. The 15c. rate from Penn to Jeannette and Grapeville and the 20c. rate from Biddle to Jeannette are held to be reasonable.

Notice has also been served by the commission that it has reason to believe that considerable disregard, deliberate or otherwise, exists of the provisions of the public service company law requiring all companies subject to the jurisdiction

of the commission to publish, post and file tariffs of charges which they assess and collect.

The commission added that it purposes to institute a vigorous inquiry into the matter and to compel delinquents to comply with the act of 1913.

Foreign Nations Buy Coal

Orders for coal aggregating more than 1,000,000 tons have been placed with dealers throughout the state during the last few days (up to Aug. 8) by business agents representing the governments of France, Italy, Germany, Austria and Russia. So strong is the demand, it is said, that practically any reasonable price is given, provided the dealers will promise to begin loading for shipment within 10 days.

Italy has taken 400,000 tons and has options on an additional 150,000 tons for future delivery. The supply is holding out well because of the withdrawal of so many steamships from active trade, and no shortage is anticipated.

In booking the orders, the exporters are facing the problem of finding vessels in which to deliver the product. Exporters believe that Germany and Austria will be forced to buy practically all of their coal in this country. In the past they have depended largely on the Welsh product. The Welsh fields will be unable to meet the demands now made upon them by England, France, Russia and Italy, and the overflow will naturally divert to this country.

PENNSYLVANIA

Anthracite

Scranton—The city controller has been compelled to hold up the bills of three mining experts, because of the lack of funds in the appropriation granted for the continuance of the mine-cave test case against the Scranton Coal Co., on which the engineers were employed.

Yorktown—The Beaver Brook colliery of C. M. Dodson & Co., which is in charge of General Superintendent John Turnbach, broke all previous records during the month of July, when over 40,000 tons of coal were prepared and shipped to market. This is a very creditable showing and is worthy of notice by reason of the fact that at this time of the year most of the other collieries are working half time.

Shenandoah—Shenandoah City and Indian Ridge collieries of the Philadelphia & Reading Coal & Iron Co. were ordered to suspend all operations on Aug. 8, indefinitely, to make general repairs, throwing 2500 men and boys out of employment.

Bituminous

Uniontown—Foreclosure proceedings have been started in the Fayette County court on an $8,000,000 mortgage held by the Colonial Trust Co. of Pittsburgh, as trustee, against the Isabella-Connellsville Coke Co. The mortgage was given Apr. 1, 1909, payable in 30 years, with interest at 5 per cent. The trust company held $8,000,000 in bonds, covering 2967 acres of 9 ft. river-vein coal in Luzerne township. It maintains the coke company defaulted in paying interest on $6,515,000 still due, and the foreclosure is for that amount and interest.

Indiana—The purchase of the holdings of the Penn-Mary Coal Co. in Indiana County by the Cambria Steel Co., of Johnstown, is reported. The operation includes nearly 25,000 acres of coal and modern plants and the mining town of Heilwood. Vice-President Slick, of the Cambria Steel Co., is in temporary charge.

Johnstown—The nine mines of the Pennsylvania Coal & Coke Corporation in Cambria County were closed indefinitely, it was stated on Aug. 4, owing to the slump in orders due to the holding up of transatlantic liners by the war. The mines of the company in this vicinity make a specialty of furnishing coal for the Atlantic liners. The mines at Beaverdale are already closed down, and it is said others will follow.

Portage—A notice was posted on Aug. 5, by the Millar Shaft Coal Co., warning all employees to remove their tools from the mine before Aug. 8, as the mine would be closed after that date. The notice is taken to mean that the workings will be closed indefinitely, owing to the rejection by the men of the company's plan to keep the shaft working pending the arbitration of the question of a checkweighman.

Dunbar—The miners employed by the Mahoning Coal & Coke Co. have struck and the mine is idle pending adjustment of the trouble. The miners say that the wagons hold 47½ bu. of coal, while they are only being paid for 40 bu. It is alleged that an employee of the company was discharged for not putting the "hump" on a wagon. Orders were issued to the effect that anyone falling short would be discharged. This was the real cause of the strike, and the miners declare they will not go back to work until they are paid for the full amount of the coal they mine.

Fayette City—The Apollo mine of the Monongahela River Consolidated Coal & Coke Co., has resumed operations after a suspension of several weeks. Approximately 300 men are employed at this operation.

Dunbar—The fire in the Atlas mine of the Cambria Steel Co., was extinguished on Aug. 3, two hours after helmet men from the Davidson and Leisenring No. 1 plants of the H. C. Frick Coke Co., a force from Johnstown, and others, had turned a hose on the blaze. Within three hours after smoke was discovered on Aug. 2, helmet men from the two Frick plants had penetrated 750 ft. into the mine and discovered the fire. How this fire started is unknown, but the damage inflicted was slight.

Connellsville—It is reported that the H. C. Frick Coke Co. has blown in nearly 400 additional ovens, and more than 200 independent ovens at the same time were blown out. As a consequence the production of coke is approximately 270,000 tons per week at the present time.

WEST VIRGINIA

Huntington—On Aug. 3, all coal loading records for one day were broken on the Chesapeake & Ohio R.R. About 110,000 tons of coal were handled by the road, this being an increase of 10,000 tons over the amount handled on any previous day in the history of the road. Officials of the company are, however, predicting that this record will be broken again during the current month.

Eccles—The coal mines of the New River Collieries Co. at this point, which were wrecked by an explosion on Apr. 28 with heavy loss of life, have been repaired, and it is said that operations will be resumed shortly. The intention now is to make the Eccles Mine the safest and best in the country.

Bluefield—It was thought when war was declared in Europe, that the Norfolk & Western R.R. would be called upon to handle large quantities of coal to Norfolk to load on ships for Europe. Up to the present time, however, instead of the coal tonnage having been increased it has fallen off. This is due to the fact that few ships are now calling at Norfolk or Hampton Roads for cargoes of coal.

ALABAMA

Birmingham—Coal operators in the Birmingham district are anxiously awaiting instructions from Washington relieving the situation at Pensacola, Mobile and New Orleans as to loading bunker and other coals on ships touching at those points. When these matters are settled, no less than 1,250,000 tons will be shipped down as fast as transportation arrangements can be made.

KENTUCKY

Pineville—The main offices of the Continental Coal Corporation, which have been located here since the organization of the company, are being moved to Straight Creek. It was desired to have the offices nearer the actual workings.

Greenville—The Greenville Coal Co. bought the Browder mine and equipment of the Caldwell Coal Co. and New York parties paid $5000 for the Peanut mine of the same company when the property was sold at auction recently. The price paid for the Browder mine was $75,000. The Greenville company about four years ago sold the Browder mine to the Caldwell company for $250,000. Soon afterward the Browder mine disaster occurred, and the tipple and machinery were destroyed. It is not announced whether the Greenville company will operate the property.

Pikeville—The Elkhorn field has been quiet of late, owing to something of a stringency in the coal market, and, though all the mines in this district have been working, they are on part time. Immediate resumption of full-time operations is said to be in prospect.

OHIO

Shadyside—With no prospect in sight as yet for an agreement between the miners and operators of the Belmont County coal districts, one of the largest mines has been closed down and will not open again for at least one year, while it is thought that several others will follow. On Aug. 7, the Fort Pitt mine was ordered completely shut down as soon as possible.

Columbus—The Franklin County Court of Appeals has upheld the ruling of the Ohio Utilities Commission made two years ago in reducing the freight rate on coal from Nelsonville to Toledo from $1 to 85c. per ton. At the time the decision was given by the commission upon the complaint

of the New York Coal Co., the case was appealed to the state courts. It is likely the case will be carried up to the Ohio Supreme Court.

ILLINOIS

Marion—Reports from several of the mines in the Williamson and Franklin County field, particularly at Johnston City, Herrin, Bush, Christopher, Benton, West Frankfort and a few of the smaller mining towns, are that large numbers of foreigners are preparing to quit work to go back to their respective countries now engaged in war, in answer to the call for reserves. This movement will afford considerable relief to the United Mine Workers, inasmuch as there are more men now in the southern Illinois field than there is work for, and the retiring of a few thousand would improve conditions wonderfully.

East St. Louis—Due to a strike in the Kansas field, coal is now being shipped from Illinois to the manufacturing cities of southeastern Kansas, while miners in the adjoining districts are idle. Railroads now have the wheat crop to move and find it difficult to keep these districts in coal, and in spite of the shipments from Illinois, have lost traffic.

Livingston—The Livingston mine of the Rutledge & Taylor Coal Co., on the Big Four R.R., recently broke all previous records of production when 4670 tons of coal were loaded in 8 hr. This is equivalent to a train of 117 forty-ton cars.

ARKANSAS

Fort Smith—A suit for $220,000 damages was filed in the United States court here Aug. 4, by Thomas Smith, a miner, against the Central Coal and Coke Co. Smith was employed in the company's mines near Hartford. On Apr. 18, 1913, he was injured by the collapse of a roof in a passageway, while he was fighting a fire. He alleges negligence on the part of the company and asks damages for injuries, for loss of future earning power, for the humiliation of his present physical condition and for the punishment because of the alleged carelessness.

The federal court here on Aug. 3 ordered the reopening of the charge of contempt of court against Peter R. Stewart, of McAlester, Okla., head of the United Mine Workers of Texas, Oklahoma and Arkansas, who was tried for violating an injunction against violence prior to the riots that resulted in the destruction of the Bache-Denman Coal Co.'s mines at Prairie Creek.

FOREIGN NEWS

Dunfermline, Scotland—Work in the coal mines in the counties of Fife, Kenross and Clackmannan, the output of which is ordinarily shipped to Continental Europe, has virtually stopped. Supplies of raw materials in the factories are also almost exhausted, and in a short time operatives as well as miners will be out of employment.

PERSONALS

Douglass Vass, for 19 years demurrage agent of the Pennsylvania R.R. at Wheeling, W. Va., recently resigned from the service of the company. He has accepted a position as sales agent of the Beech Flats Coal Co.

H. W. DePue, of Spencer, W. Va., recently closed a deal with the Muddy Valley Mining Co., by which he and others associated with him become the owners of 6000 acres of coal land under full development in southern Illinois.

F. X. Quinn, of Philadelphia, representing the bondholders, recently, bid in at $1,000,000 the Oklahoma Central R.R., running from Purcell to Lehigh in the coal fields. It is understood that the Santa Fé may lease or buy the road to secure an entrance to the coal district.

Joseph J. Walsh, state mine inspector of the 10th District of Pennsylvania is preparing a set of three text books for the help of young men engaged in mining. They are designed especially for the use of night mining schools such as have been established in various communities of the anthracite region.

OBITUARY

David Lynch, aged 66 years, formerly a coal operator at Evansville, Ind., also well known in western Kentucky, died recently at his home in Evansville. He is survived by four sons and four daughters.

William Torance, superintendent of the mine at Willock, Penn., died at the Mercy Hospital, Pittsburgh, Aug. 5, at the age of 68 years, as a result of being struck by a train. Mr. Torance was born in Scotland and came to Willock 23 years ago. He leaves four sons and two daughters.

A. P. Trautwein, organizer and former president of the Carbondale Machine Co., died Aug. 4 in his home on Lincoln Ave., Carbondale. He had been suffering from a complication of diseases for about a year, but heart trouble was given as the immediate cause of death.

Born in New York in 1857, Mr. Trautwein came to Carbondale in 1889. In 1896 he organized the Carbondale Machine Co., which has had a consistent and successful career. In addition to this concern he had been connected in an official capacity with the Los Angeles Ice & Cold Storage Co., the Spencer Heater Co., the American Acid & Alkali Co. and the Buffalo Cold Storage Co. He was an authority on the manufacture of coal illuminating gas.

Mr. Trautwein was a member of the American Society of Mechanical Engineers, the Engineers' Club of New York, the Manufacturers' Club of Philadelphia, the Engineers' Club of Scranton, and the Drug Trade Club of New York, and the Delta Tau Delta fraternity. He is survived by a wife, four daughters, three brothers and two sisters.

RECENT COAL AND COKE PATENTS

Coke Oven. F. W. Sherr, Jr., Chicago, Ill. 1,097,196. May 19, 1914. Filed Jan. 31, 1914. Serial No. 815,763.

Gas Producer. J. F. Guggolz, Teague, Texas. 1,097,715. May 26, 1914. Filed Apr. 2, 1912. Serial No. 688,071.

Coaling Device. D. Hilleman, Jr., Welleston, Mo. 1,097,434. May 19, 1914. Filed May 24, 1913. Serial No. 769,677.

Gas Producer. H. F. Smith, Lexington, Ohio. 1,098,059. May 26, 1914. Filed Sept. 20, 1912. Serial No. 721,417.

Horizontal Coke Oven. C. Still, Recklinghausen, Germany. 1,098,188. May 26, 1914. Filed Jan. 23, 1914. Serial No. 672,928.

Smoke-Consuming Heater or Boiler. E. C. Hock, Buffalo, N. Y. 1,097,718. May 26, 1914. Filed Oct. 1, 1913. Serial No. 792,793.

Circulating Tube for Steam Boilers. H. S. Vincent, Ridgewood, N. J. 1,097,830. May 26, 1914. Filed Jan. 26, 1914. Serial No. 814,357.

Process for the Production of Coke. L. Franck, Luxemburg, Luxemburg. 1,098,359. May 26, 1914. Filed Jan. 6, 1914. Serial No. 810,675.

Locomotive Furnace. F. F. Gaines, assignor to American Arch Co., New York, N. Y. 1,097,125. May 19, 1914. Filed July 24, 1913. Serial No. 780,961.

Smokeless Boiler Furnace. F. A. Shoemaker, assignor to Sturdy Smokeless Furnace Co., Buffalo, N. Y. 1,097,735. May 26, 1914. Filed July 5, 1912. Serial No. 707,722.

CONSTRUCTION NEWS

Barbourville, Ky.—The Dean Coal Co., with mines in the Brush Creek field, is preparing to electrify its mines. Contracts have been let and it is said the installation work will begin at once.

Huntington, W. Va.—Practically all of the electric apparatus at the Island Creek tipple has been dismantled and is being placed on barges to be shipped to Secatan, Ind., this being the lower loading station of the Island Creek Co.

Pikeville, Ky.—The Allegheny C k Co. is preparing to build a number of steel coke bi s at an exp nditure of $20,000, to be used as equalizers b tween th min output and shipments, as it frequently has happened that the output

exceeds the capacity of the 150 ovens now in use, or that both exceed the market orders, and conversely.

Huntington, W. Va.—According to an authoritative report, the Baltimore & Ohio R.R. is making active preparations to extend its line from Kenova up the Big Sandy River to the mouth of Shelby Creek, just below Pikeville. This line has been contemplated for some time. The route has already been surveyed, and it is believed that work will start in the near future.

Bluefield, W. Va.—Two new operations are being opened on tributaries of Widemouth Creek, the operators being the Modoc Coal Co. and the Pocahontas Co. The Norfolk & Western now has under construction a two-mile track leading up the hollow to the new operations, the steel for which is now being laid. It is expected that coal shipments will begin in a few weeks.

Houston, Texas—Plans are being worked out for a large coal wharf to be built on the south bank of the Houston ship channel at Magnolia Park. This wharf will be equipped with all modern appliances for rapid and economical handling of cargoes from ships to cars for distribution throughout Texas from the Southwest.

Harrisburg, Penn.—An ordinance providing for the construction of the proposed electric hoist to handle the great quantity of river coal on the Susquehanna River wall wharf will likely be passed by the Council in a short time. The plans were given to Warren H. Manning, the park expert, on Aug. 6, for approval. The Harrisburg Light and Power Co. wishes to erect the elevator.

New Albany, Ind.—Extensive coal chutes are to be erected in this city by the Monon Ry. Co., and the engines which heretofore have been coaled in Louisville will receive a supply of fuel in this city. The contract for the new chute has been let, and it is expected that work on the structure will begin within a short time. It is understood that all machinery will be electrically operated.

Charleston, S. C.—Plans are being prepared by the Southern Ry. for the construction of a large coal terminal at Charleston. A tract of 114 acres with 4000 ft. river frontage has been purchased from the Stonega Coal & Coke Co. This improvement will afford coal operators on the Southern Ry. an opportunity to engage in the coal export trade. The total amount to be spent by the railway will exceed four million dollars.

War, W. Va.—The Link Belt Co., of Philadelphia, was recently awarded the contract for a complete shaking screen tipple by the Warrior Coal & Coke Co. This equipment consists of a dump hopper at the drift mouth, into which the coal will be discharged from the mine cars, and from which it will be fed through a long apron conveyor which makes delivery to the shaking screen tipple at the foot of the hill. Here it will be sized into the various grades, the lump and egg being loaded to the cars by means of a loading boom.

NEW INCORPORATIONS

Cleveland, Ohio.—Papers have been filed by the Standard Pocahontas Coal Co. increasing its authorized capital from $400,000 to $500,000.

Mt. Stirling, Ky.—The Rush Branch Cannel Coal Co. has been organized, with a capital stock of $10,000. The incorporators are R. H. Winn, John A. Judy and Lewis Apperson.

Cleveland, Ohio—The Northumberland Collieries Co. has been organized with a capital stock of $10,000. The incorporators are C. C. Owens, H. T. Clark, W. S. Fleming, E. R. Diehm and F. S. Whitcomb.

Nashville, Tenn.—The Red Moon Coal Co. has been organized in Campbell County, with a capital of $15,000. The incorporators are J. L. Hefferman, S. B. Hefferman, B. F. Shuck, C. J. Cross and Charles Hughes.

Charleston, W. Va.—The Gaymont Coal Co. has been organized to operate in the Mountain Cove district of Fayette County. The authorized capital is $2000 and the incorporators are C. C. Beury, J. P. Vaughn, A. S. Guthrie, C. C. Lewis, Jr., and D. V. Reese, all of Charleston.

Central City, Ky.—People interested in the Central Coal & Iron Co. have filed articles of incorporation for the Green River Power Co., which projects an electric plant and an electric railway, a gas company and a land company. A carload of scrapers has been received and it is understood that actual construction of the railway will be begun at once.

INDUSTRIAL NEWS

New York, N. Y.—The John Simmons Co., manufacturers of the Baldwin carbide lamp, has gotten out for the use of engineers using its lamps, a table of natural sines and cosines, on heavy celluloid of a size that can be conveniently carried in the note book.

Columbus, Ohio—The National Coal and Fuel Supply Co. has moved its headquarters from Lancaster, Ohio, to Columbus and opened offices in the Hayden Bank Bldg. The company has a large acreage of coal lands in Noble and Monroe counties under lease.

Rochelle, Ill.—The Geo. D. Whitcomb Co. has taken over the busines of the C. K. Davis Mfg. Co., of Detroit, covering electric storage battery locomotives. Owing to his condition of health and his many other ventures Mr. C. K. Davis decided to dispose of his interests in this business.

Birmingham, Ala.—As a direct result of the European war a local coal broker received recently an inquiry for quotations on an order for coal up to 50.000 tons. It is expected that the inquiry will be followed by other requests for quotations on coal from this district, and the result will be a wonderful business from this unexpected source.

Columbus, Ohio—Apparently the war has no effect upon the coal trade. In all districts of Ohio, both steam and domestic users are buying as well as can be expected and it is believed by Columbus coal men that the war if continued for some time will have the effect of helping the situation as it will take much Pocahontas coal to the seaboard for bunker purposes and thus widen the market for other grades.

Tuscaloosa, Ala.—On account of the failure of Congress to pass the Rivers and Harbors appropriation bill, all work on Lock 17, situated nearly 20 miles above Tuscaloosa, on the Warrior River, has been stopped. As work on Locks 2 and 3 will not be stopped, this will not interfere with present development of mines on the Warrior up to Tuscaloosa, but the failure to continue work on Lock 17 means that the development of mines above that point and the proposed barge line, will be delayed at least a year.

Spartanburg, S. C.—The Clinchfield Fuel Co. has been awarded the contract to furnish the fleet of the United Fruit Co. with coal for a period of three years. This will be placed on board the steamers at Galveston, Texas, where the company is planning to build a large storage pier. Contracts have also been made with many different steamship lines for furnishing Clinchfield coal for bunker use at Galveston and Savannah. These contracts exceed 2,000,000 tons, and are over 500,000 tons more than last year's business thus far.

Birmingham, Ala.—A petition for authority to advance the coal rate from all of its Alabama mines to Birmingham points 10c. per ton, and to advance its present rate on coal to certain manufacturing industries located at Anniston, Gadsden, Alabama City, Attalla, Sylacauga and Talladega, Ala., from 50c. to 70c. per ton, has been filed with the Railroad Commission of Alabama by the Louisville & Nashville R. R. A similar request to advance rates was made by the Frisco R. R. These petitions are considered among the most important the Railroad Commission has ever had to consider.

Harrisburg, Penn.—Anthracite coal shipments in July aggregated 5,391,857 tons, a decrease of 95,995 tons from the same month last year. For the calendar year to date shipments total 38,337,646 tons, or 2,002,000 tons less than last year. Delaware and Hudson, Erie, and Lehigh Valley were the only companies to show an increased tonnage for July. Shipments of the first named showed the unusual increase of 82,093. Lehigh Valley tonnage was larger by 14,238 tons. Reading's shipments fell off 70,798 tons and Central R.R. of New Jersey's 66,659 tons. All companies except the Pennsylvania show decreases for the seven months ending with July, and the increase there is small.

Cincinnati, Ohio—According to Judson Harmon, one of the receivers of the Cincinnati, Hamilton & Dayton R. R., the road is carrying considerably more coal this year than last, and at less expense. Last year the road hauled 1,300,000 tons of coal during the season, from Apr. 1 to Nov. 20. Up to Aug. 1 of this year, however, the figure had already passed the million-ton mark, in spite of an extraordinary dull season, making it seem fairly certain that the 1913 record would be broken by a wide margin, and that the road would earn a much larger revenue per ton hauled, as the expense of handling the traffic has been reduced. This is an encouraging indication of better times for the road.

Coal Trade Reviews

General Review

Anthracite at the low point of the year with individuals making heavy cuts in the circular. Bituminous market replete with conflicting reports. Sentiment generally better. Negotiations for future delivery are at a higher level. Lake shipping continues unsatisfactory.

The anthracite market continues dull and flat. The steam sizes are moderately short because of the rigid curtailment in the mining regions and as a result the better grades are steady at the full circular, though concessions are still obtainable on the off qualities. Egg coal is under heavy pressure, and stove is firm. Anthracite has not been affected by the European war, with the possible exception of at the Canadian border, where it is feared that treaty complications may arise, cutting off shipments, and a heavy stocking movement is under way in anticipation thereof. As a rule the individuals are forcing the market with substantial concessions on the regular circulars.

While the current bituminous market continues relatively heavy, the situation is rather mixed, and replete with portentious possibilities. So far the European war has only interfered with shipments, several foreign vessels calling at Hampton Roads for cargoes, having turned back again rather than risk capture. Steamers sailing out of New York Harbor, however, are said to be taking large surplus tonnages, and the fact that the leading bunkering and export company at that point is working full capacity and holding all production close is significant evidence of the trend of conditions. Conservative members of the trade are inclined to go slow, but some companies are beginning to speed up operations, thoroughly convinced that the turning point has been reached. Premiums on future deliveries are already being offered.

The situation in the Pittsburgh district is even more discouraging, with the line trade still further reduced, and the movement in the Lakes disappointing, though an improvement is expected before the end of the month. Pittsburgh operators will not benefit by any increase in the export trade as a result of the foreign war, except as they may be called upon to make up deficiencies created by such demand. There is a general feeling that stocks in the hands of consumers are at a low point ,and the development of any extra outside demand would create an active situation.

The approach of the stocking up season is bringing out many inquiries in Ohio, and operations are being rapidly resumed. The steam business is also opening up better, while the Lake shipping is one of the best features of the market; chartering is active, and large tonnages are being moved though it is clear that the total for the year will not equal last season's. The market is quiet at the present, and some difficulty is experienced in maintaining the circular.

Though Southern consumers continue holding off in anticipation of a break in the market, the situation is becoming steadily stronger, with the approach of the fall buying season. The possibility of a heavy demand for foreign shipments at the Southern ports is also having a beneficial effect. Many inquiries are being received in the Middle Western trade which, supplemented by advances in the circular, indicate a strong situation shortly. The Ohio coals are in conspicuously strong demand, and it may be some time before any of these can be received. Prices are steady to firm.

ATLANTIC SEABOARD

BOSTON

A broad market expected shortly, but chiefly for export; summer tieup regarded as only temporary. Premiums paid for future shipments. Local situation improves, but no great demand anticipated. Outlook favorable for Georges Creek and Pennsylvania grades. Anthracite quiet.

Bituminous—There are all kinds of opinion in the trade as to the effect of the European war on early fall business, but most people are agreed that by October or November there will probably be a broad market for coal, especially off shore. The tieup of transatlantic business threatened for a few days to flood the tidewater trade with the coal brought down for bunker use, but that situation has been pretty well adjusted by increased requisitions from the ships that are still in the service. The Hampton Roads situation has also changed within a few days. Some of the shippers, who are closely in touch with foreign buyers, are looking to heavy business, and are very cautious about commitments coastwise for September and October. Already, premiums are said to have been paid for futures; up to $3 f.o.b. has been rumored, and there can be no doubt now of a fairly active market as the season advances. In other lines there is much confidence of heavy dealings with other countries by reason of the war, and particularly with South America.

Locally the Pocahontas and New River market has continued to improve, especially as regards prices obtained. The "market-cargo" menace seems to have been pretty well ironed out. Stocks are large everywhere, and it is not expected there will be a very insistent call from this section for the West Virginia coals, even if prices do advance materially. In other words, conditions in New England are not likely to be affected very much, whatever price development there may be the next two or three months.

The demand for Georges Creek continues to improve and shippers of this grade are also anticipating an extra demand off-shore. The "Kronprinzessin Cecille," at Bar Harbor, Me., is taking aboard two cargoes of that grade.

If there is a material advance in prices at Hampton Roads, there will certainly be a wider market for the soft-coal output of Pennsylvania. Many of the shippers are now well supplied with orders and feel confident that there will be ample business the balance of the year. The all-rail trade shows a gain, particularly in the sections where low-priced tidewater coal is no longer a factor.

Anthracite—The mines are still under curtailment and will remain so until the fall demand opens up. With several of the companies, stove is still the size in shortest supply, and boats are occasionally detained for that reason. The movement to the consumer is rather slow beginning this season, but by September dealers are expected to be calling for fresh supplies. The prospect is good for a strong market during the fall and winter. The efforts of independents to sell at prices well below the company circular have so far had only a negligible result.

Retail prices in Boston were advanced 25c. Aug. 10, making stove and egg now $7.75 per net ton delivered.

Wholesale prices on bituminous are about as follows:

	Clearfields	Cambrias Somersets	Georges Creek	Pocahontas New River
Mines*.....	$0.90@1.45	$1.20@1.70	$1.67@1.77	
Philadelphia*.....	2.15@2.70	2.4 @2.95	2.92@3.02	
New York*.....	2.45@3.00	2.7 @3.25	3.22@3.32	
Baltimore*.....	.....	.....	2.85@2.95	
Hampton Roads*.	.....	.....	.....	$2.80@2.95
Boston†.....	.....	.....	.....	3.58@3.78
Providence†.....	.....	.....	.....	3.53@3.68

* F.o.b. †On cars.

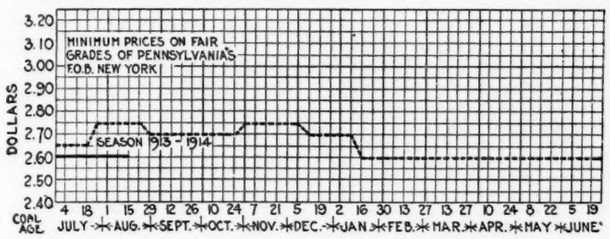
NEW YORK

Bituminous situation full of uncertainties. Indications point to a sharp advance. Bunkering and export business erratic. Numerous inquiries of all kinds. Anthracite heavy and dull.

Bituminous—The local situation is distinctly mixed, business being conducted on a day to day basis, the general tendency being to hold off pending further developments. Predictions as to the future trend of conditions are conflicting almost to extremes. The more conservative old-line companies entertain great doubts as to the future while the more aggressive factions assert positively that the market is on the verge of a sharp advance of from 50c. to $1 per ton within the next 30 to 60 days at least. It is agreed by all that there are foreign and domestic inquiries for enormous tonnages in the hands of the agencies, and should these develop into actual business and the problem of securing water transportation be solved, an active situation will result. That our government will work out some method whereby foreign vessels can be utilized for shipment to neutral ports is the firm belief of the trade.

Generally speaking there has been a complete disruption of the bunkering and export trade at Tidewater though it is a significant fact that there is little accumulation of surplus coal; in fact one company reports current supplies now at the lowest price for several years. The Berwind-White Co., who practically control the export and bunkering business in New York Harbor, are working their mines at full capacity ,and holding their coal closely. It is stated that the liner "Olympic," which sailed the early part of the week, carried 25,000 tons of coal, and that all other vessels are loading heavily.

In spite of the many uncertainties now prevailing, the current market is not quotably changed from the past few weeks which we continue as follows: West Virginia steam, $2.50@2.60; fair grades Pennsylvania, $2.55@2.65; good grades of Pennsylvania, $2.70@2.80; best Miller Pennsylvania, $3.10@3.15; Georges Creek, $3.15@3.25.


MINIMUM PRICES ON FAIR GRADES OF PENNSYLVANIA'S F.O.B. NEW YORK
SEASON 1913-1914
DOLLARS
3.20
3.10
3.00
2.90
2.80
2.70
2.60
2.50
2.40
4 18 1 15 29 12 26 10 24 7 21 5 19 2 16 30 13 27 13 27 10 24 8 22 5 19
COAL AGE
JULY AUG. SEPT. OCT. NOV. DEC. JAN FEB. MAR. APR. MAY JUNE

Anthracite—The hard-coal market continues dull and uninteresting. Unlike bituminous it will not be effected by the European wars except insofar as some tonnages are used to replace bituminous coal diverted into other channels. It is believed that consumers as a rule have bought less than in former years, and the stocks at Tidewater are somewhat lighter than customary at this period.

Broken and egg coal are about holding their own as regards supply and demand although there is possibly somewhat of a surplus of egg coal. Stove is in short supply but not sufficiently so to command a premium on average business. Chestnut is by far the weakest of the domestic grades; it is offered at concessions ranging from 25 to 50c. from the regular circular, and is even then difficult to move.

The restricted operations in the mining regions have had a steadying effect upon the steam sizes, the better qualities being in more demand at the full circular. The poorer grades are in excess supply, and are obtainable at less than the circular. The line trade in anthracite as a rule is improving.

The New York hard coal market is quotable on the following basis:

	Upper Ports		Lower Ports	
	Circular	Individual	Circular	Individual
Broken	$5.00	$4.60@5.00	$4.95	$4.55@4.95
Egg	5.25	4.90@5.25	5.20	4.85@5.20
Stove	5.25	5.15@5.25	5.20	5.00@5.20
Chestnut	5.50	4.95@5.50	5.45	4.75@5.45
Pea	3.55	3.40@3.55	3.50	3.25@3 50
Buckwheat	2.80	2.60@2.80	2.50@2.75	1.90@2 75
Rice	2.30	2.15@2.30	2.00@2.25	1.50@2.25
Barley	1.80	1.60@1.80	1.75	1.25@1.75

PHILADELPHIA

Anthracite continues stagnant, although inquiry is improving and prospects better. Early fall demand is expected soon. Bituminous prices unchanged, and demand about the same.

Anthracite—There seems to be an undercurrent of better feeling, due to the fact that there is considerably more inquiry. It is expected that the fall business will open up more favorably than is usually the case, and this is already indicated in the tidewater business. Quite a volume of business is already coming in for late August delivery.

Locally the trade still continues stagnant. There is very little coal being consumed, and as the price is but 10c. below the maximum for the year, inducements to buy are not particularly strong. The individual operators still force business with attractive prices. Egg and chestnut are offered at the April circular, and on the medium grades, concessions from the circular on stove are obtainable. Pea is selling at most any price to move it; as a matter of fact, chestnut and pea seem to be the stumbling blocks in the way of an increased production. Prices are:

	Circular	Individual
Broken	$4.65	$4.65
Egg	4.90	4.60 @ 4.70
Stove	4.90	4.90
Chestnut	5.15	4.90 @ 5.00
Pea	3.25	3.00

Bituminous—There is considerable speculation as to the probable result of the Continental war on the bituminous trade. Up to the present time, very little in the way of tangible business has been received. The tieing up of numerous ocean vessels has caused some congestion at tidewater points, but the actual domestic market has not changed.

BALTIMORE

Attention centering on the export trade and inquiries arriving. Anthracite and bituminous business on domestic account very flat.

With the Welsh mines closed to outside markets, and with the growing demand for American coal indicated in cable inquiries that are being received in this country, the trade is wondering just how much of this will develop into actual business. Even if unable to build up trade with the warring nations themselves, the American producers and agencies may find it possible to break into the South American and Mediterranean business. The transportation question is the main problem, but this will surely be solved as the demand from the other side is so urgent that purchasers will assume all risks. It may be some weeks, however, before this situation develops into actual business.

In the domestic trade there is little of interest. Demand is poor and prices on the same level. There is more of a congestion at tide than has been noted for some time past, and it would not take much to start more price cutting. An increasing export trade now would indeed prove a blessing.

Slack continues falling off, West Virginia products being sold as low as 50c., with three-quarter gas offering at 85c. Pennsylvania coals held steady, cheaper grades being on the market at slightly below the dollar mark, and the better fuels running from $1.15 to $1.35.

Anthracite—Companies report a free movement on contracts, but very little doing in the way of new demand.

Coastwise Charters hold firm, and shipping interests are figuring that if there is a growing South American demand for our fuel, rates will advance. Many vessels of the strictly domestic fleet could be used for more distant delivery.

HAMPTON ROADS

Dumpings at Hampton Roads piers only about fair; war in Europe interfering with the bunker trade. Prices continue unchanged.

Dumpings for the week have been fair. Coastwise shipments have improved, perhaps, to some extent, although little coal is moving except by steamers. A large number of schooners in this trade have been taken off and are remaining idle until conditions improve. The largest coastwise shipment to leave this port for some time was loaded during the week into the American S. S. "Arizonan," which took 11,183 tons from Lamberts Point for the U. S. Naval Station at Mare Island, Calif. The bulk of the coal for the New England market went to Boston, although some shipments moved to Portland, Allyns Point, Bangor and Fall River.

Prices on New River and Pocahontas as well as on the high volatiles remain about the same as they have been for some weeks, with little demand for spot shipments on either grade.

War between the European countries is causing the bunker trade to suffer, as few cargo vessels are leaving the Southern ports. Such bunkers as are arriving here, in a majority of cases, are remaining in port, although some few are risking capture and taking the chance of reaching their European destination.

Foreign cargoes for the week have been loaded for Canal Zone, St. Lucia, Fray Bento, Santiago, Venice, Naples and La Plata. Some of these vessels were loaded before war was declared between England and Germany. It is understood that one of the British steamers which has a cargo for Italy will remain in port for some time or until there is less danger of capture.

LAKE MARKETS

PITTSBURGH

Mine operations unchanged, at close to 70% of nominal capacity. Prices continue very irregular. No definite influence felt in the district on account of the war thus far.

The coal trade of the Pittsburgh district has not been particularly affected by the war thus far, though doubtless it is going to be affected indirectly, through the influences of other markets, which have to do with Tidewater shipments. Line demand has experienced a slight further decrease in the week, stocks being reduced and operations in the steel

industry increasing slightly. The steel trade expects considerably more activity than would have been the case without the war. Ocean freight movement is expected to be restored shortly, at least in a way, and there ought to be a very heavy export movement, seeing that the United States has hitherto been exporting only about 2,500,000 tons of iron and steel a year, while England, France, Belgium and Germany have had the rest of the international market, about 10,000,000 tons a year and are now practically shut off from shipping at all.

The lake coal movement continues disappointing but there are still predictions that shipments will be heavier before the end of the month. Satisfaction is expressed that the decision in the rate case eliminates any possibility of coal freight rates being advanced. Mines are operating at close to 70% of nominal capacity and prices continue very irregular. Circular prices, which are nominal even as to contracts, are as follows: Slack, 80@90c.; nut and slack, $1.05; nut, $1.25; mine-run, $1.30; ¾-in., $1.40; 1¼-in., $1.50, per ton at mine, Pittsburgh district.

BUFFALO

Slight improvement in bituminous, but no real activity as yet. Excess supplies still in consumers' hands. Anthracite finds a rushing war sale in Canada, but little elsewhere.

Bituminous—There is a somewhat better movement all along the line and fewer reports of coal selling at sacrifice prices. It is not expected that there will be any improvement of account till the worst of the war scare is past, as some factories are shutting down, especially in Canada. The effect of the war will be serious on all industries, though it may not last long.

It is becoming more evident each week that the coal in consumers' hands is steadily disappearing, whether the consumption is increasing or not. More coal must be bought from this time on if business is to continue as usual. At present everybody is feeling the effect of the war in one way or another. It is the uncertainty as to the duration of the war that is making most of the trouble.

One or two of the larger companies with headquarters in this district are running their mines at full capacity, on the supposition that there will soon be a heavy European demand for coal, but actual orders are still lacking.

Prices of bituminous are possibly a trifle stronger, on the basis of $2.80 for Pittsburgh lump, $2.70 for three-quarter, $2.55 for mine-run, and $2.15 for slack, with slack not as active as formerly. Allegheny Valley sizes are about 25c. lower than Pittsburgh. Only the very best coal can be sold at quoted rates.

Anthracite—There is no improvement in the local or line trade and none is anticipated at present, but Canada is buying urgently. Orders are coming in for hundreds of cars from single concerns in Toronto, while other towns on that side of the border are buying briskly. The idea is that something may happen that will in some way shut off the supply. The International (Grand Trunk) bridge opposite this city is guarded by troops, and it is suggested that the Buffalo end should be guarded also.

The Lake shipment of anthracite has fallen off somewhat for the reason that the agents of the companies cannot get the coal freely, and since the Canadian demand has set in it cut down receipts materially. Shipments for the week were 144,000 tons, which is quite below the Lake average for the past two months. It is said that the dock capacity at Upper-Lake ports is not what it was, and that some of the shipping companies at least will not long be able to keep up the former pace.

TOLEDO

Canadian and Lake shipments not effected by neutrality laws. Possibilities of the European war. Market quiet at the moment but with an excellent undertone.

Shipment on the Lakes is not included in the neutrality laws according to advices to the Toledo customs office from Washington, D. C. This will release considerable delayed coal. Opinions concerning the effect of the European war on the local markets vary but it is generally thought that should the war be a long drawn out affair the coal business of the United States will be benefitted although the first effects will be a slowing up.

It is probable that considerable American coal will be sent to Canada and the demand there will be largely for the smokeless variety. Just at present slack is a drug on the Toledo market and dealers are finding trouble disposing of stocks. Business is reported somewhat dull in some sections but showing improvement in others. Dealers seem to be buying a little more freely. A car shortage is looming up in the near future and in fact some complaints are already sifting in.

COLUMBUS

Operation of mines in most districts is being resumed. Eastern Ohio operators fail to agree with the miners. Coal now being shipped to the Lakes.

The past week has seen a general resumption of mining in the Hocking Valley, Jackson, Cambridge and Pomeroy districts. In the Crooksville section, the scale was also adjusted, and preparations have been made to resume work Aug. 10. On every hand, the situation is clarifying with the exception of eastern Ohio.

Sales managers report a good demand for both domestic and steam grades. Dealers are getting ready for the stocking-up season, which is expected to be active towards the latter part of the present month. Buying of domestic sizes is going on actively and most of the orders are for immediate shipment. It is expected that domestic prices will be advanced after Sept. 1. There is a marked preference shown in the domestic trade for Pocahontas and rescreened varieties.

The Steam Trade is active, although West Virginia coal in the local trade affects quotations. Manufacturing plants have little surplus on hand and they have been waiting for the settlement of the strike before entering into contracts. Very few contracts have yet been closed, but negotiations are progressing. Prices on steam contracts are expected to be about the same as the previous year.

The Lake Trade is now one of the best features of the industry. Some of the larger operators in the Hocking Valley are shipping a heavy tonnage to Lake ports for passage to the Northwest. While the shipments this year will not be equal to last season, a good trade is expected from this time until the close of navigation. Chartering of boats is going on actively and the supply is adequate. The Toledo docks of the Hocking Valley Ry. have hauled 1,281,000 tons since the start of the present season.

Prices in the Ohio fields:

	Hocking	Pittsburgh	Pomeroy	Kanawha
Rescreened lump	$1.60		$1.65	$1.50
1¼ inch	1.50		1.50	1.50
¾-inch	1.30	$1.20	1.35	1.30
Nut	1.15		1.35	1.15
Mine-run	1.10	1.05	1.15	1.10
Nut, pea and slack	0.65		0.65	0.60
Coarse slack	0.55	0.60	0.55	0.50

CLEVELAND

Broader inquiry, but demand is still light. Prices are barely holding on slack and larger sizes are moving slowly. The retail trade is materially improved over a week ago. Lake business does not change.

Excepting in the retail trade, the sales of coal are rather limited. Slack is selling at $1.55 to $1.60 without a large working balance on track. Steam sizes are being sold largely on orders for shipment. The demand is so light and the market in such a weak condition, consignments are not being sent here to any extent.

Pocahontas prepared sizes are short and the Pocahontas Fuel Co. is refusing orders for lump and egg for future shipment. In a letter to one of the jobbers recently, the sales manager of that company said a large South American trade is expected in the near future, which will cause an increase in prices.

Massillon operators, who failed to make a contract with the miners last week, have signed up individually and are quoting domestic sizes, lump and washed nut, at $2.50 at the mines. While no circular quotation is being made on Massillon slack, operators are tentatively naming 95c. at the mines as a fair price. The freight rate to this market is 70c.

Hocking mines have been so greatly hampered by local labor troubles that quotations have been withdrawn for two weeks by many of the companies. These and the No. 8 are the only mines now closed. The conference of the miners and operators of the No. 8 field at Wheeling failed to effect an agreement, and there are no immediate prospects of cleaning this up now. A large amount of coal has been sold to the trade regularly using No. 8 coal.

With new grain arriving at the Upper Lake ports, shipments of coal from the docks to interior points are improving. The betterment is slow, but shippers are preparing to do a larger business the latter part of this month.

Quotations are as follows:

	Pocahontas	Youghiogheny	Fairmount	W.Va. No. 8
Lump	$3.60			
Lump, 1¼ in.		$2.50		
Lump, ¾ in.		2.20@ 2.25	$2.05	$2.05@ 2.10
Egg	3.60			
Mine-run	2.60	2.15	1.95	2.00
Nut		2.20		
Slack	2.35	1.55@1.65	1.70	1.55@ 1.60

CINCINNATI

The market continues sluggish. Production increasing in the idle fields and the demand fails to pick up. Lake movement is increasing in volume. Possibilities of the war situation.

Dealers still show a marked disinclination to buy at circular prices, because of the slow demand, and while operators are firm in their refusal to make concessions, they are selling little coal. Deliveries on old contracts comprise most of the business at present, and few new contracts are now being closed. The sluggishness of the steam market even exceeds that on the domestic side; the resumption of the various steam consumers is slow, and in some cases hardly perceptible.

The European trouble is naturally the subject of much comment. The principal effect hoped for is a marked stimulation of the numerous industries which have been working on short time; on the other hand, a more pessimistic view contemplates the possibility of a still wider depression, due to inability to secure ocean carriers.

DETROIT

Market slow and quiet but generally firm. Shortage of labor. Heavy business anticipated this fall.

Bituminous—The local market has been slow, yet not particularly bad; steam trade has been passibly good in the city, the smaller sizes being in a little better demand and prices steadier than for several weeks past. The domestic trade has fallen off due to the inability of the dealers to secure labor to unload the cars as a result of the heavy demand along other lines that are now starting up.

COKE

CONNELLSVILLE

The coke market shows absolutely no signs of life. The furnaces in operation are evidently fully covered through this month at least, and it is questionable whether any fresh purchases will have to be made even for September. Idle merchant furnaces are showing no disposition to go into blast, particularly with the situation further complicated by the war. The steel mills expect larger production eventually, on account of increased exports, their competitors abroad in the international iron and steel markets being all at war, and thus eventually the consumption of coke may increase through additional steel works furnaces blowing in. Prices may be quoted nominally at the former level: Prompt furnace, $1.75; contract furnace, $1.75@2; prompt foundry, $2.25@2.35; contract foundry, $2.35@2.50, per ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Aug. 1, at 269,575 tons, an increase of 1285 tons, and shipments at 269,591 tons, an increase of 2230 tons, shipments and production being balanced.

BUFFALO

The local coke trade is still "flat." Bituminous will show the first real improvement and that will make it necessary to advance coke. Some think that the iron trade will be first to start, but coal has taken the lead sometimes and may do so again. Few dealers care to handle coke, as they declare there is more difficulty with it now than there ever is when business is brisk. Quotations remain on the basis of $4.25 for best 72-hr. Connellsville foundry and $3.25 for stock coke.

DETROIT

Connellsville foundry is bringing $3 on the local market, Semet Solvay $3.50 and gas house, $3.25, f.o.b. ovens.

BALTIMORE

Coke remains a drug on the market. Officials of the Maryland Steel Co. are figuring, however, that the war may bring them some increased activity in the end.

BIRMINGHAM

While the actual business being done in furnace and foundry coke has not materially improved, still, the operators believe that conditions are better.

CHICAGO

So far as coke is concerned, the situation remains about the same. Domestic is a little more active owing to a slightly better demand. Prices are: Connellsville and Wise County, $5; byproduct egg, stove and nut, $4.75; gas house, $4.25.

SOUTHERN

BIRMINGHAM

Lump coal dull. Steam grades show some improvement. European war creating much inquiry. Bunkering and export business expected to increase in next two weeks.

The market on lump coal does not seem to improve to any extent, very few orders being received, and no immediate increase is looked for in this line. The retail yards are still holding off placing orders, believing that the operators will lower prices, but with fall approaching, the producers are not inclined to reduce quotations, preferring to run on short time rather than sacrifice their lump coals.

While the demand for steam coal is just about the same as last week, the outlook is encouraging for an early resumption of full-time operations because of the European war; inquiries are being received by many of the operators for a large tonnage, approximating 1,500,000, for shipment to Mobile and Pensacola. While it is not certain that this business will be obtained, it is evident that this section will be called upon to supply a large amount of coal through the Gulf ports should the war last long. Birmingham operators expect this business will materialize within the next two weeks.

LOUISVILLE

Increases and decreases caused by foreign wars will about equalize each other. Some improvement with the approach of fall.

Kentucky coals are in better demand than they have been for some time. Some of the operators are of the opinion that the war in Europe, provided it is prolonged, will very largely increase the demand upon the American mines; others figure that increased requirements will be more than offset by similar decreases, so that one will balance the other.

The results from the war on this market will be generally indirect. It is admitted that a large demand on the Eastern coals would have the effect of diverting local fuels into new channels, although but little will reach to the coast. On the other hand, some Kentucky manufacturing enterprises, notably tobacco plants, the entire output of which goes abroad, have shut down altogether to await developments.

Most of the improvement in the demand is normal so far, due to the fact that the summer is drawing to a close and that dealers are stocking up. Prices remain unchanged from a week ago.

MIDDLE WESTERN

INDIANAPOLIS

Mining slightly improved, due to increased domestic demand for winter storage. Inquiries from factories better. Indianapolis retailers make their second summer advance in the circular.

There is little change in the Indiana situation. The demand for domestic grades shows some improvement, as retailers have made their second summer advance, and it has stimulated the buying of the winter stores. Railroad buying is somewhat better, but not up to expectations.

There has been a little gain in mining operations, more particularly in the Brazil block field, but there are signs of slackening again, now that threshing of wheat and oats is practically over. The mines have had a month of continuous work, and there will now be a lull until the regular fall rush opens. The southern Indiana mines report more inquiry from factories, which seem to be preparing for larger operations.

Indianapolis retailers have advanced prices 25c. a ton and guarantee only August delivery at the new basis, though it may remain longer.

The new schedule of retail prices in this city is:

Anthracite, chestnut	$8.25	Winifred, lump	$4.50
Anthracite, stove and egg	8.00	Hocking Valley, lump	4.50
Anthracite, grate	7.75	Luhrig, lump	4.50
Pocahontas, forked lump	6.00	Luhrig, washed egg	4.75
Pocahontas, shoveled lump	5.50	Cannel	6.00
Pocahontas, mine run	4.50	Linton No. 4 lump	3.50
Pocahontas nut and slack	3.75	Linton No. 4 egg	3.50
Blossburg	5.50	Sullivan No. 6	3.50
Jackson (Ohio)	5.25	Indiana washed egg	3.75
Kanawha, lump	4.50	Brazil block	4.50
Kanawha, egg and nut	4.25	Connelsville coke	6.00
Pittsburg, lump	4.50	Citizens egg coke	6.00
Raymond, lump	4.50	Citizens nut coke	6.00

CHICAGO

Local operators cautious over future commitments. European war seriously affecting the situation. Large shortage of Hocking grades.

Carterville operators are expecting a good demand from the domestic buyers. On lump and egg coal, the larger producers are holding for $1.50 at the mines and accept lower prices only on orders placed prior to Aug. 1. Smaller operators have fixed $1.35 as the minimum on lump and egg. A few of the larger companies in the Franklin County field report that they are obtaining $1.60 for lump and egg. In the central Illinois field, screenings are on a decline.

The Anthracite situation shows slight improvement. The leading companies report that the market is considerably behind what it was at this time last year, some estimates placing it at 20 per cent. less.

Small shipments of Hocking coal are being received but orders are probably already in excess of what can be obtained for some time. The opening price is $1.50, the same as the market closed at on Apr. 1.

Prevailing prices in Chicago are:

	Springfield	Franklin Co.	Clinton	W. Va.
Domestic lump	$2.07	$2.45@2.65	$2.12	
Steam lump	1.87@1.92		1.97	
Egg		2.45@2.65		$4.05
Mine run	1.87	2.15@2.25	1.87	3.30
Screenings	1.52@1.57	1.75@1.80	1.52@1.57	

Quotations on Harrisburg coal are: Domestic lump and egg, $2.40@2.55; steam lump, $2.25; mine-run, $2.15@2.25; screenings, $1.75@1.80; No. 1 nut, $2.55; No. 2 nut, $2.40.

Carterville prices are: Lump and egg, $2.40@2.55; No. 1 washed, $2.55@2.70; No. 2 washed, $2.35@2.40.

ST. LOUIS

Market generally buoyant on most lines. Demand stronger and advances in the circulars. Exceptionally heavy business anticipated this fall.

Many inquiries, with prices advancing, indicates what may be expected in the next three or four weeks. Lump and egg is extraordinarily strong in the high grade market, while nut and screenings and the steam sizes are slow. No. 1 washed has picked up a little in some places, but in a general way it has not improved since last week. In the Standard market, screenings are still on the downward path, with lump advancing slightly. High grade screenings are also dropping off.

Anthracite still continues to move promptly and there is nothing to complain about in the coke market. Smokeless, however, is still slow.

The retailers report exceptionally heavy business for August, and especially on the high-grade coals. Manufacturing plants are not in the market now for various reasons, and this has caused a surplus of steam sizes to accumulate.

In a general way there is nothing to complain of at this time in the local market. The prevailing circular is:

	Williamson and Franklin Co.	Big Muddy	Mt. Olive	Standard	Sparta
2-in. lump	.....	....	.....	$0.90@1.00	$1.10
3-in. lump	.....	....	$1.30	.....	.....
6-in. lump	$1.30@ 1.60	....	1.40	1.05@1.15	1.20
Lump and egg	1.85@ 2.15	$2.15	.....	....	1.15
No. 1 nut	1.10@ 1.30	....	.....	.....	.....
Screenings	0.70@ 0.75	....	0.80@0.85	0.55@0.65	0.60
Mine-run	1.00@ 1.15	....	.....	0.75@0.80	.....
No. 1 washed nut	1.40@ 1.50	2.25	1.50	....	.....
No. 2 washed nut	1.25@ 1.30	....	1.35	....	.....
No. 3 washed nut	1.15@ 1.20	....	.....	....	.....
No. 4 washed nut	1.10@ 1.15	....	.....	....	.....
No. 5 washed nut	0.70@ 0.75	....	.....	....	.....

The Williamson and Franklin County coals take a rate of 67c. to St. Louis, and the retail price is $3.25 to 3.50 per ton. Murphysboro coal takes a 2½c. lower freight rate, and retails at $4 a ton. All other coals take a rate of 52c. a ton to St. Louis. Sparta retails at 11c., Mt. Olive at 11c., and Standard at 9 and 10c. a bushel; 25 bushels to the ton.

The August Anthracite circular (wholesale is: Chestnut, $7.45; egg and stove, $7.20; grate, $6.95. Retail prices are 95c. higher.

KANSAS CITY

Domestic trade a little slow, due to the strike last week. Local and outside trade has profited already by the large wheat crop.

Coal trade in Kansas City was improving to a marked extent until the strike in the Kansas district, Aug. 3. The wheat crop made large business for the thrashing. The temporary financial uneasiness affected the city trade. The most noticeable effect of the strike locally is in steam plants usually burning Cherokee products; those not having any surplus are employing Missouri screenings which are cheaper and satisfactory in an emergency.

PRODUCTION AND TRANSPORTATION STATISTICS

ANTHRACITE SHIPMENTS

Anthracite shipments for July and the first seven months of this year and last year were as follows:

	July		7 Months	
	1914	1913	1914	1913
Phila. & Reading	831,965	902,763	6,863,613	7,761,147
Lehigh Valley	1,026,225	1,011,987	7,181,300	7,604,118
Cent. R.R. N.J.	708,891	775,550	5,097,978	5,351,214
Del. Lack. & West.	826,771	871,677	5,425,277	5,661,037
Del. & Hudson	671,682	589,589	4,087,557	4,094,128
Pennsylvania	406,769	439,912	3,623,848	3,607,018
Erie	717,201	683,161	4,707,228	4,762,953
Ont. & Western	202,362	213,213	1,350,845	1,498,091
Total	5,391,857	5,487,852	38,337,646	40,339,706

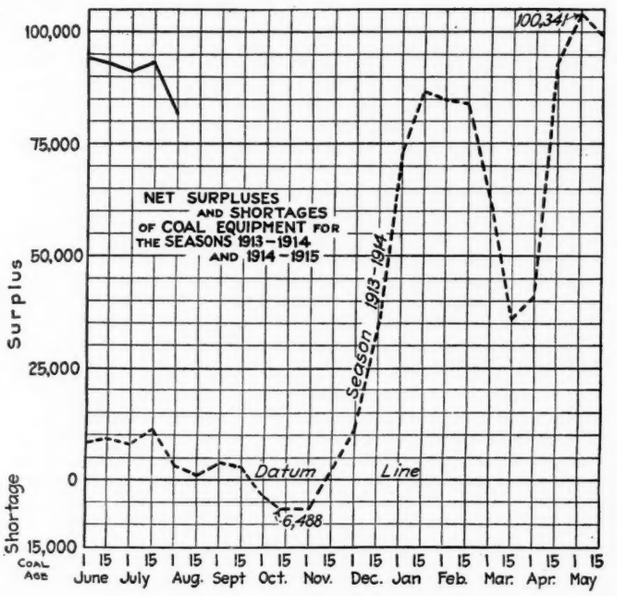
THE CAR SITUATION

American Ry. Association reports surpluses and shortages of coal equipment for two weeks ended Aug. 1, as follows:

	Surplus	Shortage	Net*
New England Lines	1,281	0	**1,281**
N. Y.; New Jersey, Del.; Maryland; Eastern Penn.	17,718	0	**17,718**
Ohio; Indiana; Michigan; Western Pennsylvania	41,557	0	**41,557**
West Virginia, Virginia, North & South Carolina	5,447	0	**5,447**
Kentucky, Tenn.; Miss.; Alabama, Georgia, Florida	3,965	0	**3,965**
Iowa, Illinois, Wis., Minn.; North & South Dakota	6,135	0	**6,135**
Montana, Wyoming, Nebraska	984	0	**984**
Kansas, Colorado, Missouri, Arkansas, Oklahoma	1,807	82	**1,725**
Texas, Louisiana, New Mexico	275	28	**247**
Oregon, Idaho, California, Arizona	3,115	0	**3,115**
Canadian Lines	0	0	**0**
Total	82,284	110	**82,174**

	Apr. 1	Apr. 15	May 1	May 15	June 1	June 15	July 1	July 15
Surplus	41,055	92,139	100,370	99,664	94,770	93,520	91,280	93,509
Shortage	615	24	29	313	7	49	430	292
Net*	**35,851**	**40,440**	**92,115**	**100,341**	**99,351**	**94,763**	**90,850**	**93,217**

***Bold face** type indicates a surplus.



FOREIGN MARKETS

GREAT BRITAIN

Business is practically at a standstill owing to the European crisis. The British Admiralty authorities have practically placed a lien on the collieries producing Admiralty-List coals.

Quotations are, nominally:

Best Welsh steam	$5.16@5.40	Best Mountainshires	$4.08
Best seconds	4.56@4.80	Seconds	3.84@3.96
Seconds	4.20@4.32	Best Cardiff small	2.58
Best dry coals	4.20@4.32	Seconds	2.46

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those of Monmouthshire descriptions are net f.o.b. Newport; both exclusive of wharfage, and for cash.